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Intensive Archeological Survey for Proposed Improvements to Farm-to-Market Road 2100 from South Diamondhead Boulevard to FM 1960 Harris County, Texas

Melissa M. Green

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Prepared by
Melissa M. Green, MA, RPA (Principal Investigator)
Cox|McLain Environmental Consulting, Inc.
6010 Balcones Drive, Suite 210
Austin, TX 78731

For
Texas Department of Transportation
Houston District

Under
Texas Antiquities Permit 7228

Cox|McLain Environmental Consulting Inc.
Archeological Report 099
(CMEC-AR-099)

COX | McLAIN
Environmental Consulting

December 15, 2015

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a memorandum of understanding dated December 16, 2014, and executed by FHWA and TxDOT.

Abstract

An intensive archeological survey was completed in order to inventory and evaluate archeological resources within the footprint of proposed widening improvements to Farm-to-Market Road (FM) 2100 between South Diamondhead Boulevard (Blvd) and FM 1960 in eastern Harris County, Texas. The project is approximately 7.7 miles or 12.4 kilometers (km) in length and has a typical width of between 100 to 300 feet (ft) or 30 to 91 meters (m); the project will be up to 1,000 ft or 305 m wide at detention pond locations. The APE is 204 acres or 83 hectares with 107 acres or 43 hectares of the total being new right-of-way. Typical roadway construction would occur within 2 ft or 0.6 m, with possible deeper impacts for construction of drainage elements and a presumed depth of up to 10 ft or 3 m at detention ponds. Fieldwork was conducted on April 20, 2015, and on July 21-22, 2015, under Texas Antiquities Permit (TAP) 7228. Based on the review of the Houston Potential Archeological Liability Map (PALM), most of the project area (168.18 acres) was determined to fall within Map Unit 4, for which survey is not recommended. The review of the PALM indicated that the remainder of the project area (35.82 acres) should be subjected to varying stages of intensive survey, including the excavation of shovel tests and/or mechanical trenching. All of the acreage subject to a level of intensive survey was determined to have been subjected to ground-disturbing activities associated with agriculture, erosion, and construction and maintenance of the existing road. No new archeological sites were identified during the survey and no artifacts were identified or recovered. Project records will be curated at the Center for Archeological Studies (CAS) at Texas State University.

Management Summary

On April 20 and July 21-22, 2015, a reconnaissance and intensive survey was completed in order inventory and evaluate archeological resources within the footprint of improvements to Farm-to-Market (FM) 2100 between South Diamondhead Boulevard (Blvd) and FM 1960 in eastern Harris County, Texas. A preliminary reconnaissance survey was conducted on April 20, 2015, but due to extensive, long-term flooding in the project area, no subsurface investigations were conducted until July 21-22, 2015. The archeological area of potential effects (APE) is approximately 7.7 miles or 12.4 kilometers (km) in length and has a typical width of between 100 to 300 feet (ft) or 30 to 91 meters (m); the project will be up to 1,000 ft or 305 m wide at detention pond locations. The APE is 204 acres (83 hectares) with 107 acres (43 hectares) of new right-of-way. Typical roadway construction would occur within 2 ft or 0.6 m, with possible deeper impacts for construction of drainage elements and a presumed depth of up to 10 ft or 3 m at detention ponds.

The proposed improvements would widen the existing two-lane, undivided facility to a four-lane, divided facility and include areas to be used for the construction of detention ponds. North of Hare Cook Road, the proposed roadway would have 12-ft travel lanes, two in each direction, separated by an 18-ft median, and 12-ft outside shoulders. Five-ft sidewalks would be constructed on both sides of the roadway. South of Hare Cook Road, the roadway would also have two travel lanes in each direction; the outer lane would be a 15-ft shared use lane, and the inner lane would be 12 ft wide. This section of the roadway would also have a raised median and 5-ft sidewalks. The proposed project would require additional right-of-way at various locations. Seven detention ponds are also proposed along the corridor.

The fieldwork was carried out under Texas Antiquities Permit (TAP) 7228 by Melissa M. Green (Principal Investigator), Haley Rush, and Ryan Middleton of Cox|McLain Environmental Consulting, Inc. (CMEC). Approximately 350 labor-hours have been invested in the archeological phase of compliance work for the overall project. The project is sponsored and funded by the Texas Department of Transportation (TxDOT) Houston District. The project is subject to Section 106 of the National Historic Preservation Act (NHPA) as well as the Antiquities Code of Texas.

The entire alignment was subjected to a reconnaissance survey with areas of specific interest (those with possible historic deposits or deeply buried deposits) subjected to pedestrian survey and/or trenching. The reconnaissance survey documented disturbances and development that was not known prior to the fieldwork. There was only a small number of properties (less than five) for which access was denied or there was no response to an access request but those properties were sufficiently examined from adjacent properties or the current right-of-way. Ground surfaces within the APE were generally moderately to highly (50 to 80 percent) visible, although there were some areas of lower (30 percent) visibility due to vegetation overgrowth. Most of the new-location APE has been severely impacted and deflated by agricultural practices, particularly sod or turf farming.

In addition, the portion of the APE that is immediately adjacent to the existing FM 2100 roadway has been impacted by previous roadway construction, maintenance, and utility installations (electric, gas, telecommunication) that follow and/or cross the right-of-way.

The majority of the APE (168.18 acres) falls within the Houston Potential Archeological Liability Map (PALM) Map Unit 4, where no survey is recommended due to the occurrence of Pleistocene landforms, urban land, and/or dredge spoil. The remaining 35.82 acres required some level of survey, with 35.8 acres falling into Map Unit 2a (recommended surface survey of pimple mounds only) and 0.02 acres into Map Unit 1 (both deep trenching and surface survey is recommended). A total of four shovel tests were excavated across the APE, and four backhoe trenches were excavated in a proposed detention pond location along Gum Gully. Shovel tests revealed silty loam over clayey silt deposits to a depth of 50 centimeters below surface (cmbs), while backhoe trenches yielded clay deposits from the surface to a depth of about 200 cmbs. Shovel tests were only excavated in areas where previous agricultural impacts were not apparent, ground visibility was less than 30 percent, and the PALM map units suggested intact soils that would possibly contain archeological deposits.

No new archeological sites were identified and no artifacts were collected; therefore, only project records will need to be curated per TAC 26.16 and 26.17. Project records will be permanently housed at the Center for Archaeological Studies (CAS) at Texas State University.

The Texas Historical Commission (THC) concurred with the findings and recommendations of this report on September 17, 2015.

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1.0 INTRODUCTION

Overview of the Project

The Houston District of the Texas Department of Transportation (TxDOT) has proposed road widening improvements to Farm-to-Market Road (FM) 2100 between Crosby and Huffman in eastern Harris County, Texas (**Figures 1 and 2a-d**). The proposed improvements would widen the existing two-lane, undivided facility to a four-lane, divided facility and include areas to be used for the construction of detention ponds. North of Hare Cook Road, the proposed roadway would have 12-ft travel lanes, two in each direction, separated by an 18-ft median, and 12-ft outside shoulders. Five-ft sidewalks would be constructed on both sides of the roadway. South of Hare Cook Road, the roadway would also have two travel lanes in each direction; the outer lane would be a 15-ft shared use lane, and the inner lane would be 12 ft wide. This section of the roadway would also have a raised median and five-ft sidewalks. The proposed project would require additional right-of-way along most of the route with larger areas needed for seven proposed detention ponds.

The archeological area of potential effects (APE) measures 7.7 miles or 11.6-kilometer (km) long with varying width between 100 to 300 feet or 30 to 91 meters (m); the project would be up to 1,000 feet or 305 m wide at detention pond locations. The total project acreage is 204 acres with 97 acres of existing right-of-way, 107 acres of proposed new right-of-way; the new right-of-way acreage includes 75 acres for roadway improvements and 32 acres for detention ponds.

Melissa M. Green (Principal Investigator) and Haley Rush of Cox|McLain Environmental Consulting, Inc. (CMEC) performed preliminary reconnaissance fieldwork on April 20, 2015, to determine areas that required intensive survey with shovel testing and mechanical trenching. Due to excessive rains and extensive flooding, the intensive survey was conducted on July 21-22, 2015, by the Principal Investigator and Ryan Middleton. Four shovel test units were placed judgmentally within areas of the APE based on observed disturbance levels (many), ground surface visibility (very good to excellent), and guidelines established by the Council of Texas Archeologists (CTA) and approved by the Texas Historical Commission (THC). In addition, four backhoe trenches were placed in a proposed detention pond along Gum Gully. The methods employed during this study and relevant constraints are discussed further in Chapters 3.0 and 4.0. Approximately 350 labor-hours have been invested in the archeological phase of compliance work for the overall project.

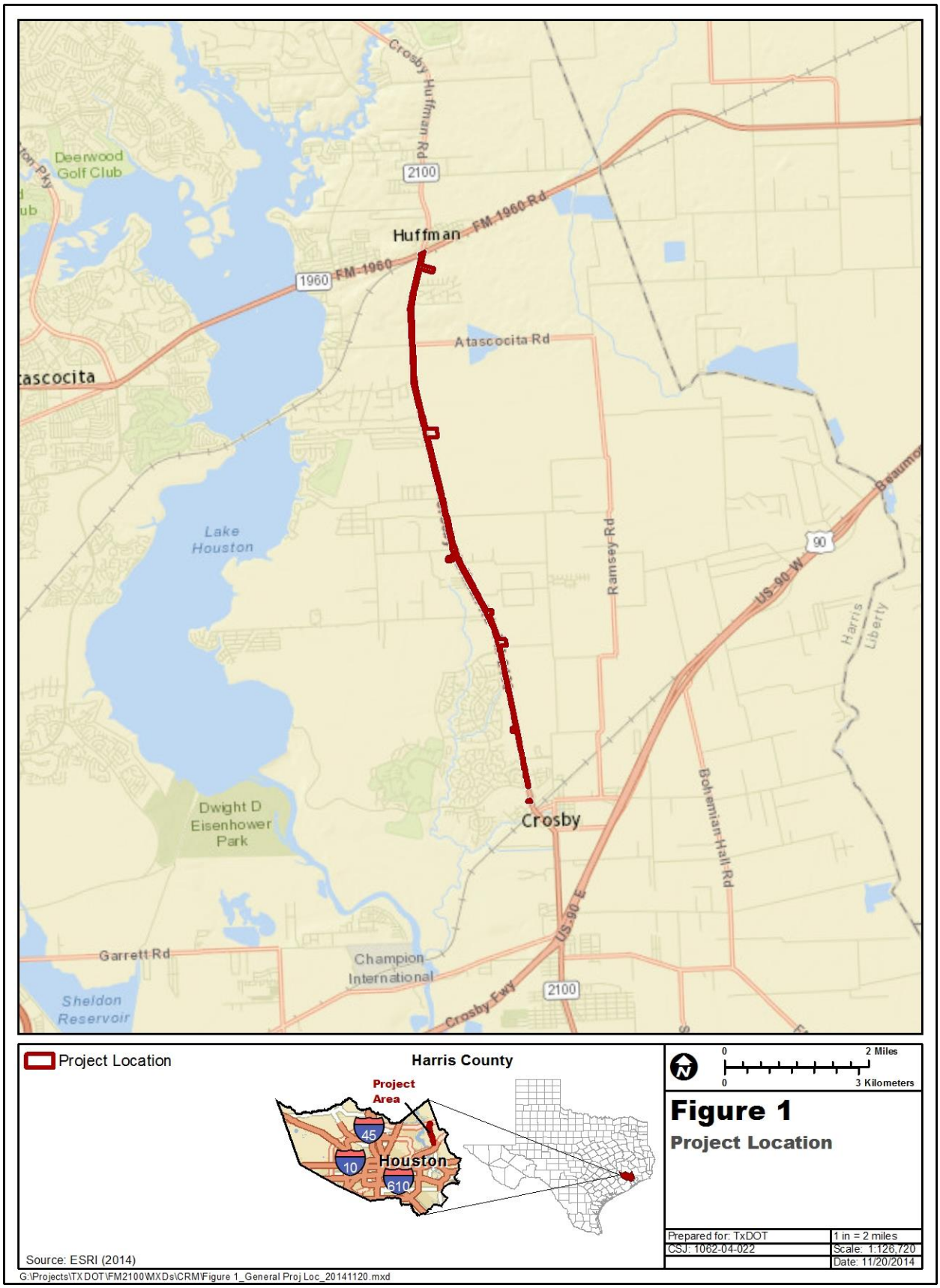
Regulatory Context

FM 2100 is owned and sponsored by TxDOT Houston District, a political subdivision of the State of Texas, rendering the project subject to the Antiquities Code of Texas (9 TNRC 191). Antiquities Permit 7228 was assigned to this project by the THC. The project also has a federal nexus,

triggering Section 106 of the National Historic Preservation Act (NHPA), as amended (16 USC 470; 36 CFR 800). Reconnaissance and intensive archeological survey was completed in order to inventory and evaluate archeological resources within the footprint of the proposed improvements. No new archeological sites were identified and no artifacts collected. All other materials (notes, photographs, administrative documents, and other project data) generated from this work will be curated at the Center for Archaeological Studies (CAS) at Texas State University where they will be made permanently available to future researchers per 13 TAC 26.16-17.

Structure of the Report

Following this introduction, Chapter 2.0 presents environmental parameters, a brief cultural context, and a summary of previous archeological research near the APE; Chapter 3.0 discusses research goals, relevant methods, and the underlying regulatory considerations; Chapter 4.0 presents the results of the survey and summarizes the implications of the investigations; and references are in Chapter 5.0.


Crosby Huffman Rd
2100
Deerwood Golf Club
Huffman
FM 1960 Rd
1960
FM 1960
Atascocita Rd
Atascocita
Lake Houston
Ramsey Rd
US-90-W
90
Harris
Liberty
Dwight D Eisenhower Park
Crosby
Bohemian Hall Rd
US-90-E
Garrett Rd
Champion International
Sheldon Reservoir
Crosby Fwy
2100
Project Location
Harris County
Project Area
45
10
Houston
610
Source: ESRI (2014)
0
2 Miles
0
3 Kilometers
Figure 1
Project Location
Prepared for: TxDOT
CSJ: 1062-04-022
1 in = 2 miles
Scale: 1:126,720
Date: 11/20/2014
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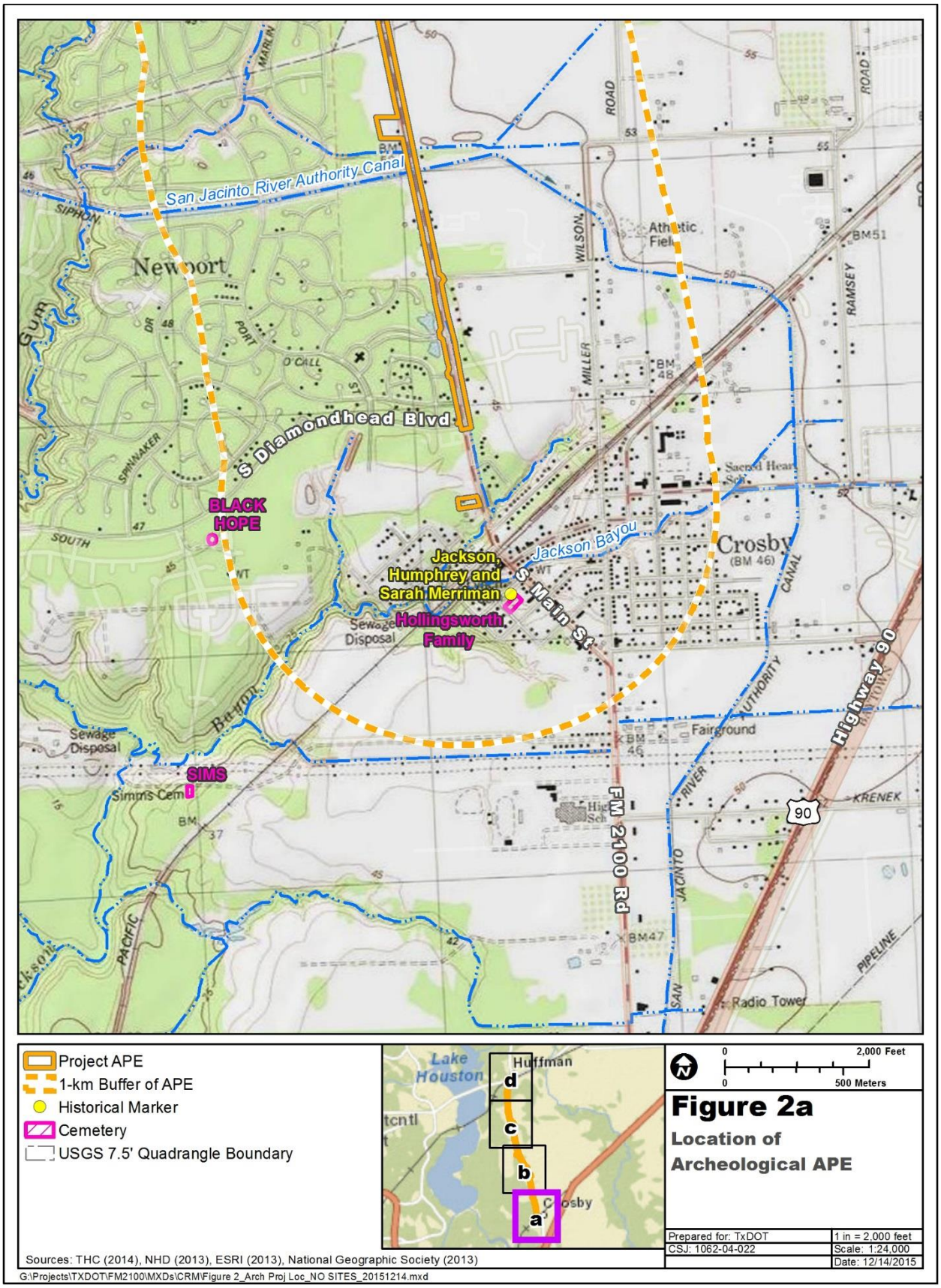
San Jacinto River Authority Canal
S Diamondhead Blvd
BLACK HOPE
Jackson, Humphrey and Sarah Merriman
Hollingsworth Family
SIMS
Simms Cem
Jackson Bayou
S Main St
FM 2100 Rd
Highway 90
Crosby
(BM 46)
Newport
Fairground
Sewage Disposal
Radio Tower
Project APE
1-km Buffer of APE
Historical Marker
Cemetery
USGS 7.5' Quadrangle Boundary
Lake Houston
Huffman
Crosby
a
b
c
d
0 2,000 Feet
0 500 Meters
Figure 2a
Location of Archeological APE
Prepared for: TxDOT
CSJ: 1062-04-022
1 in = 2,000 feet
Scale: 1:24,000
Date: 12/14/2015
Sources: THC (2014), NHD (2013), ESRI (2013), National Geographic Society (2013)
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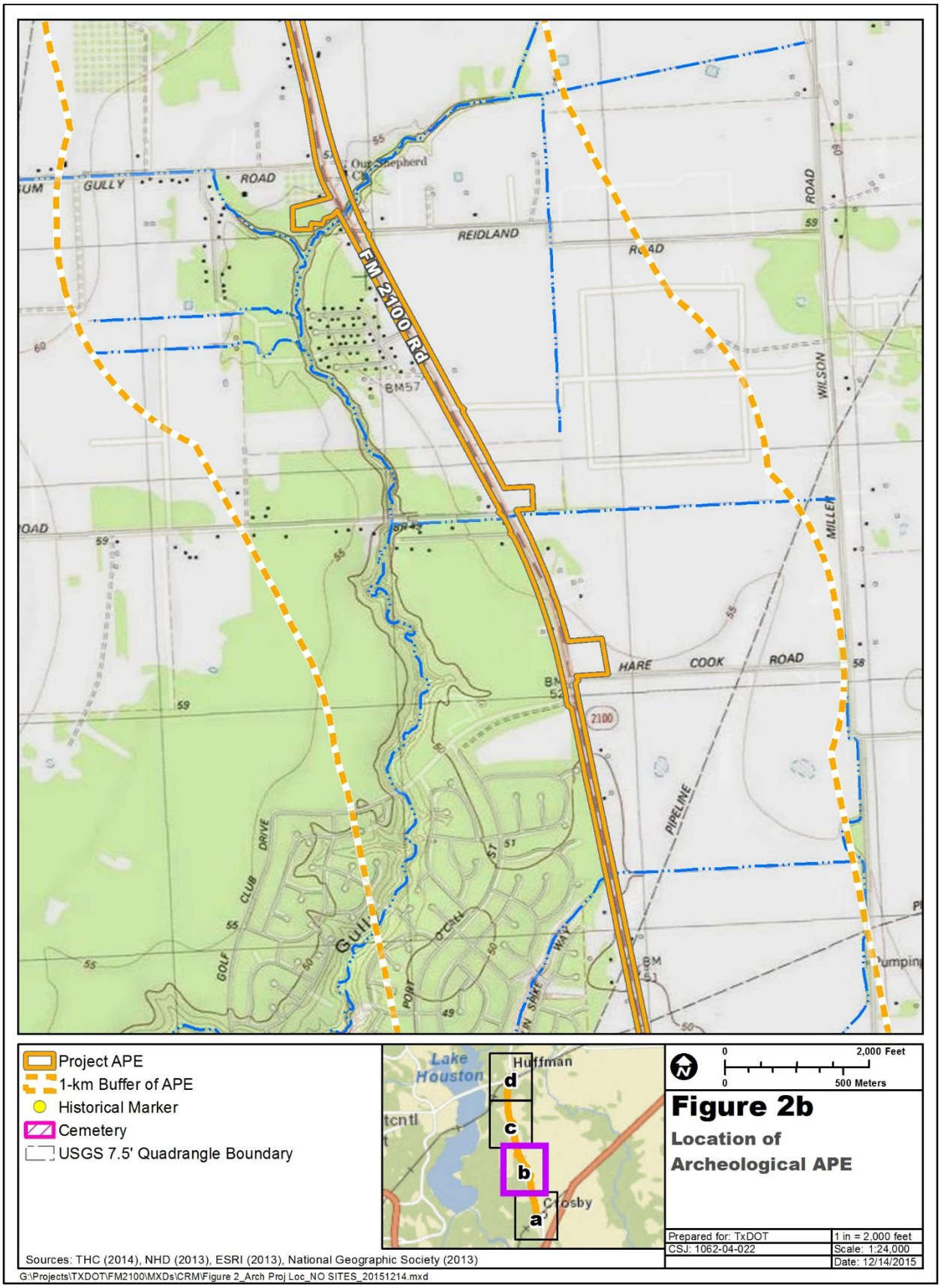
FM 2100 Rd
REIDLAND ROAD
GULLY ROAD
HARE COOK ROAD
WILSON ROAD
MILLER ROAD
PIPELINE
CLUB DRIVE
GOLF
BM57
2100
Project APE
1-km Buffer of APE
Historical Marker
Cemetery
USGS 7.5' Quadrangle Boundary
Lake Houston
Huffman
Crosby
a
b
c
d
0
2,000 Feet
0
500 Meters
Figure 2b
Location of Archeological APE
Prepared for: TxDOT
CSJ: 1062-04-022
1 in = 2,000 feet
Scale: 1:24,000
Date: 12/14/2015
Sources: THC (2014), NHD (2013), ESRI (2013), National Geographic Society (2013)
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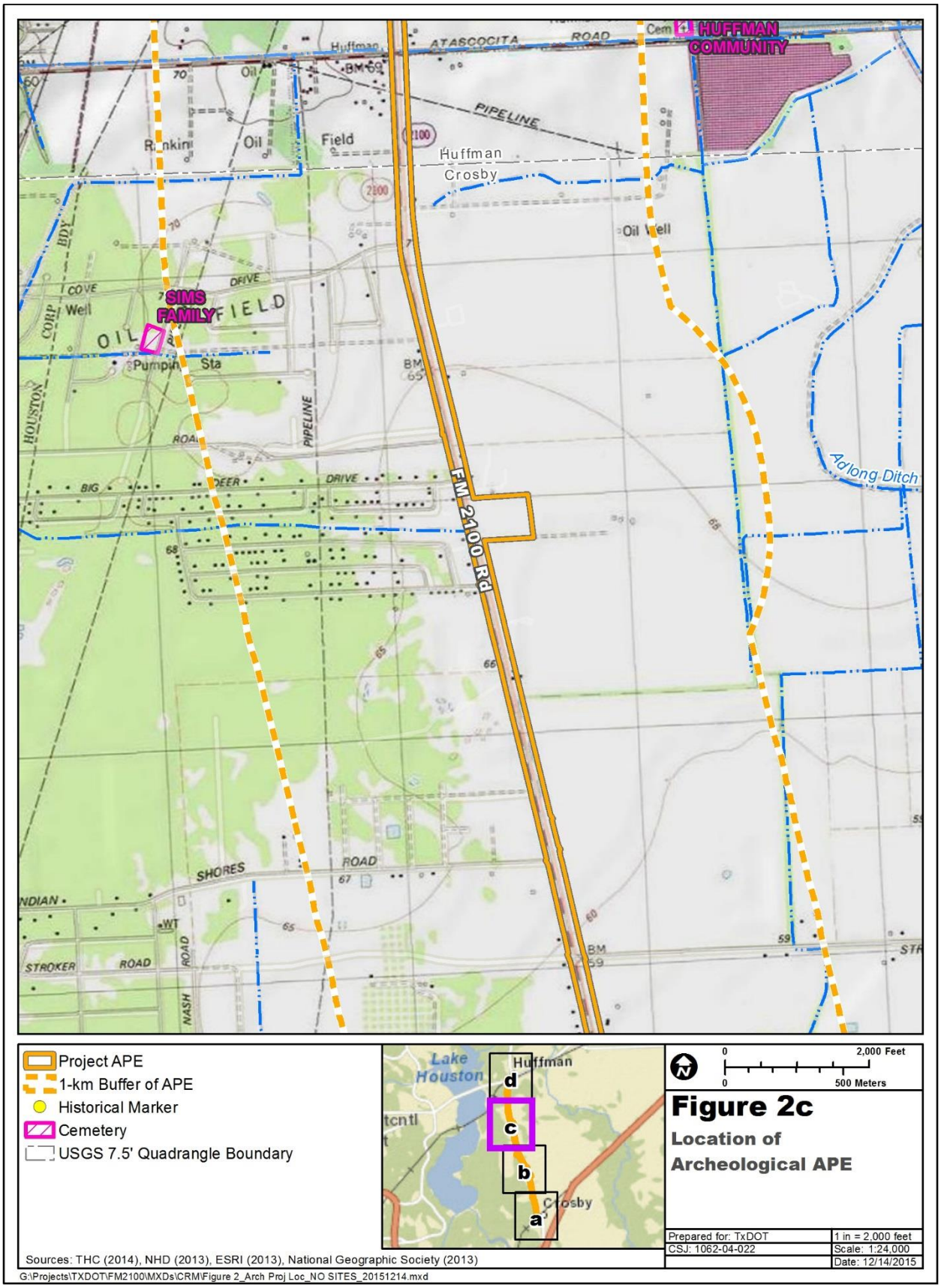
HUFFMAN COMMUNITY
SIMS FAMILY
FM 2100 Rd
Project APE
1-km Buffer of APE
Historical Marker
Cemetery
USGS 7.5' Quadrangle Boundary
Lake Houston
Huffman
Crosby
a
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d
0
2,000 Feet
0
500 Meters
Figure 2c
Location of Archeological APE
Prepared for: TxDOT
CSJ: 1062-04-022
1 in = 2,000 feet
Scale: 1:24,000
Date: 12/14/2015
Sources: THC (2014), NHD (2013), ESRI (2013), National Geographic Society (2013)
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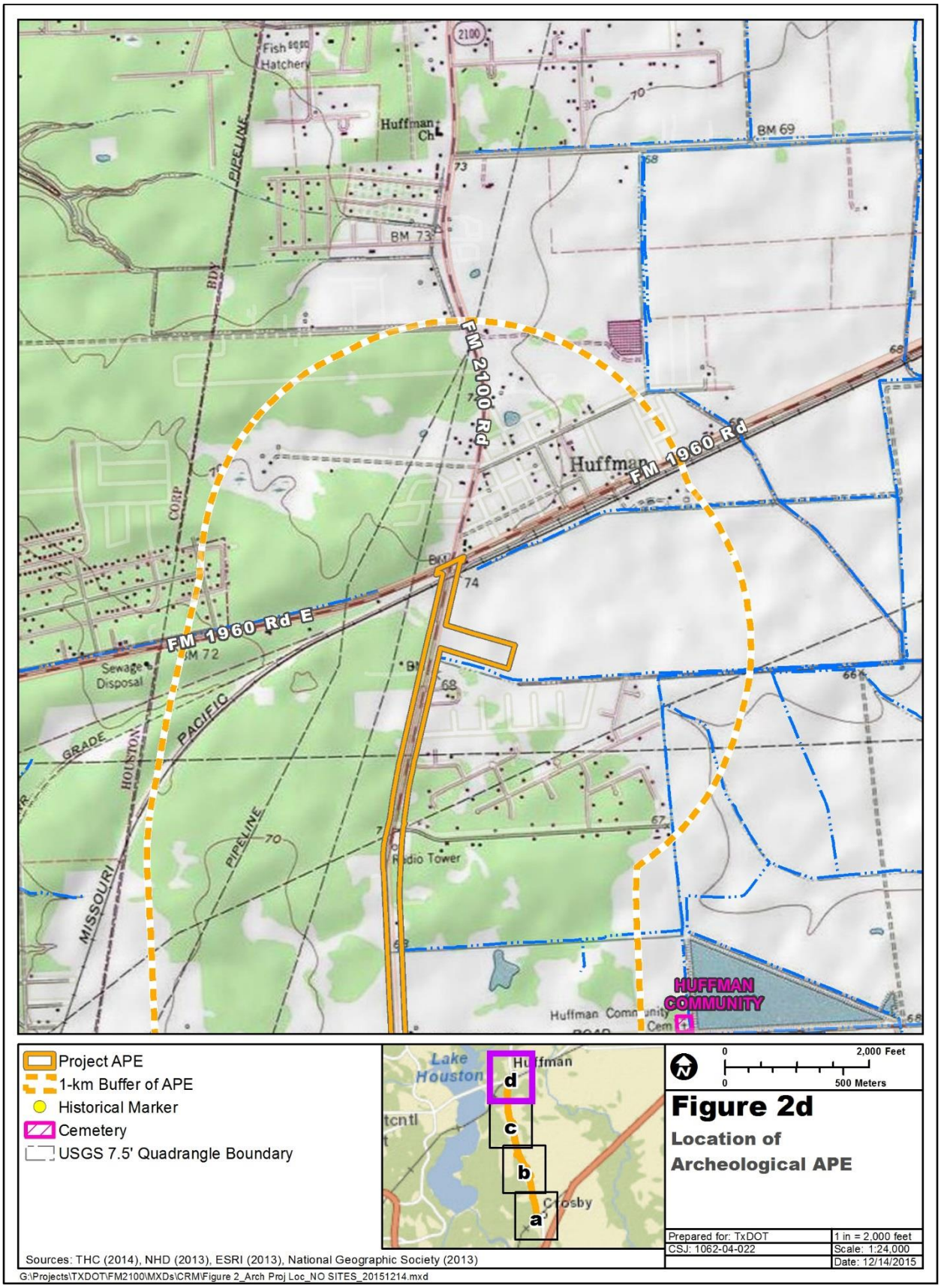
FM 2100 Rd
FM 1960 Rd
FM 1960 Rd E
Huffman
HUFFMAN COMMUNITY
Huffman Community Cem
Fish Hatchery
Huffman Ch
BM 69
BM 73
BM 72
Sewage Disposal
Radio Tower
PIPELINE
CORP
PACIFIC
GRADE
HOUSTON
MISSOURI
Project APE
1-km Buffer of APE
Historical Marker
Cemetery
USGS 7.5' Quadrangle Boundary
Lake Houston
Huffman
Crosby
a
b
c
d
0
2,000 Feet
0
500 Meters
Figure 2d
Location of Archeological APE
Prepared for: TxDOT
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1 in = 2,000 feet
Scale: 1:24,000
Date: 12/14/2015
Sources: THC (2014), NHD (2013), ESRI (2013), National Geographic Society (2013)
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2.0 ENVIRONMENTAL AND CULTURAL CONTEXT

Topography, Geology, and Soils

Harris County is located within the Coastal Prairies of the Gulf Coastal Plain physiographic province, a plain of relatively flat topography that dips slightly toward the Gulf of Mexico (Texas Almanac 2015). The APE is at elevations ranging from approximately 50 to 80 ft (15.2-24.3 m) above mean sea level (amsl) along a 7.7-mile or 11.6-kilometer (km) segment of FM 2100 beginning at FM 1960 on the north end and continuing south to South Diamondhead Blvd in eastern Harris County. The project area is situated in a combination rural, undeveloped and agricultural setting that is rapidly developing through suburban expansion. It is geologically underlain by Pleistocene Beaumont Formation with barrier island and beach deposits (BEG 1979; 1982) and according to Natural Resources Conservation Service (NRCS) data, the mapped soils in the APE, from south to north, are Beaumont clay on 0 to 1 percent slopes, League clay on 0 to 1 percent slopes, Viterbo silty clay loam on 0 to 1 percent slopes, LaBelle clay loam on 0 to 1 percent slopes, and LaBelle-Urban land complex on 0 to 1 percent slopes (NRCS 2015).

Vegetation, Physiography, and Land use

The project is located in the Pineywoods ecoregion at the north end and crosses into the Gulf Prairies and Marshes ecoregions going south, according to the Texas Parks and Wildlife (TPWD) Ecoregion Map (TPWD 2011), derived from Gould et al. (1960). According to the TPWD's *Vegetation Types of Texas* map and accompanying descriptions, the APE is in an area (Type 42) mapped as being covered with "Pine-Hardwood Forest" and is of Subtype 4 (McMahan et al. 1984). Subtype 4 is primarily made up of longleaf pine and sandjack oak with other pine and oak varieties mixed in with flowering dogwood, sweetgum, sassafras, American beautyberry, wax myrtle, yaupon, hawthorn, yellow jessamine, slender bluestem, broomsedge bluestem, and little bluestem (McMahan et al 1984:25). Vegetation noted during the survey included various types of native and invasive grasses, blackberry bushes, thorny vines, and oak, cottonwood, and other hardwood trees. Many of the surrounding parcels are currently in sod or turf farms.

Archeological Chronology for Southeast Texas

The APE lies within the Southeast Texas archeological region (Kenmotsu and Perttula 1993; Patterson 1995; Perttula 2004; Story et al. 1990) with a cultural history that extends back at least 12,000 years into the past. Human occupation during these 12,000 years are divided into four broad periods: Paleoindian, Archaic, Late Prehistoric, and Historic. The periods are based on a proposed sequence of economic strategies identified though the archeological and historical record. These proposed shifts in dominant lifeways consider cultural, economic, and technological factors in order to provide a model useful for attempting to understand ancient and early historic populations. The dates assigned to the period interfaces represent a generalized time range but are based on

scientific results from archeological research. The dates provided are derived from Perttula (2004) and are presented in **Table 1**.

Further discussion of the prehistory of Southeast Texas is beyond the scope of this document. For such a discussion regarding the prehistoric record, the reader is referred to Aten 1983; Ensor 1991; Patterson 1995, Shafer et al. 1975; Story et al. 1990; among others.

Table 1: Archeological Chronology for Southeast Texas*

Period	Years Before Present**
Paleoindian	
Early	11,500 – 10,000 B.P.
Late	10,000 – 8, 000 B.P.
Archaic	
Early	8,000 – 6,000 B.P.
Middle	6,000 – 3,500 B.P.
Late	3,500 – 2,200 B.P.
Tchula	2,200 – 2,000 B.P.
Ceramic	
Early	2,000 - 1,200 B.P.
Late Prehistoric	12,000 – 270 B.P.
Protohistoric	270 B.P.

*From Perttula 2004: 9, Table 1.1
**Based on uncalibrated radiocarbon dates, which are typical in Texas archeology (see Perttula 2004: 14, Note 1).

Historic Context

European contact in the region possibly began in the early sixteenth century with Álvar Núñez Cabeza de Vaca's travels up the San Jacinto River from Galveston Island about 1529 to trade with the woodland Indians (Henson 2010). Anglo-American settlement began in the early 1820s with twenty-nine Mexican land grants being claimed along Buffalo Bayou, the San Jacinto River, and the San Jacinto estuary as part of Stephen F. Austin's empresario grant. The area grew fairly rapidly as more families arrived and several communities began to develop and the area became known as Harrisburg Municipality.

Harris County, originally Harrisburg County, was formed by the First Congress on December 22, 1836, with the infant city of Houston designated the county seat and national capital. The county encompassed the territory of the old municipality as well as Galveston Island (the mainland was attached to Brazoria County) until May 1838, when its modern boundaries were established. In

December 1839, Congress changed the name to Harris County, in honor of John R. Harris, founder of Harrisburg Municipality (Henson 2010).

The APE falls in eastern Harris County between the communities of Huffman and Crosby. Huffman was first settled in 1839 by David Huffman (Kleiner 2010). By 1888 a post office was established and there were two blacksmith shops operating there by 1892. The Beaumont, Sour Lake, and Western Railway came to the community in the early 1900s and by 1905, there were two schools, one for black students and one for white students. Huffman remained a small community with about 50 inhabitants until about 2000, when the population reached 250 (Kleiner 2010).

Crosby was named after G. J. Crosby, a railroad construction engineer (Smith 2010). The first store opened there in 1865 by Charlie Karcher and the town quickly became a retail and shipping center for lumber and agricultural products between the San Jacinto River and Cedar Bayou. A post office opened in 1877 and by 1884 the community had a population of 50, a school, a Baptist church, and a general store. By 1891, it had grown to have a Methodist church and two livestock stables. It became a banking center in 1929 with a population of 600. During the Depression, the population fell but grew rapidly during World War II and for the next twenty-five years afterward. The population has continued to grow with a population of 1,714 souls and 455 businesses in 2000 (Smith 2010).

Previous Investigations and Previously Identified Resources

A search of the Atlas maintained by the THC and the Texas Archeological Research Laboratory (TARL) was conducted in order to identify archeological sites, historical markers, Recorded Texas Historic Landmarks (RTHLs), properties or districts listed on the National Register of Historic Places (NRHP), State Antiquities Landmarks (SALs), cemeteries, or other cultural resources that may have been previously recorded in or near the APE, as well as previous surveys undertaken in the area.

A review of the Houston Potential Archeological Liability Map (PALM) reveals that the majority of the APE (168.18 acres) falls within Map Unit 4. Within this unit, no survey is recommended due to the occurrence of Pleistocene landforms, urban land, and/or dredge spoil. There are, however, four small sections of the APE between Reidland Road and Beckman Drive, totaling 35.8 acres, that fall within Map Unit 2a, where surface survey of pimple mounds only is recommended, and 0.02 acres of Map Unit 1, where both deep trenching and surface survey is recommended (**Figure 3a-f**; Abbott 2001).

According to the Atlas search, one archeological survey has been conducted within the APE (THC 2015). In addition, one survey not recorded in the Atlas is known to also be within the APE (McWilliams 2005). The Atlas-recorded survey within the APE was conducted in 2009 by HRA Gray & Pape, LLC for a proposed City of Crosby Municipal Utilities Department (MUD) wastewater

utility project consisting of the replacement of one mile of gravity sewer line and installation of 1.3 miles of new main force (Scott 2009). No new archeological sites were encountered.

The non-Atlas recorded survey was conducted in 2005 by Prewitt and Associates, Inc., for the widening of 11.8 miles (19 km) along FM 2100 from Huffman-Caney Road south to Hare Road (McWilliams 2005). This TxDOT-sponsored project covered the portion of the current project APE from FM 1960 to Hare Road, or approximately all but the 0.4 miles (0.6 km) at the southernmost end of the APE. The 2005 Prewitt survey was restricted to current right-of-way and areas that did not require full right-of-entry, primarily north of FM 1960. Four backhoe trenches and six shovel test units were excavated along the 11.8 miles (19 km) survey corridor; all six of the shovel tests were in the current APE and located near North Diamondhead Blvd. and north of the San Jacinto River Authority Canal (McWilliams 2005). It was recommended that no further work was necessary within existing right-of-way that is within the current APE. However, areas of proposed right-of-way where pimple mounds were observed (Map Unit 2a) and where historic locales were identified (between Indian Shores and Foley Roads, and one location south of Hare-Cook Road), were recommended for further work and/or evaluation (McWilliams 2005:12).

Historic aerial photographs (from Nationwide Environmental Title Research or NETR) and more recent Google Earth images (viewed through Google Earth Pro) were reviewed in the areas reported to have pimple mounds by McWilliams and/or mapped as Unit 2a on the PALM. Based on a comparison of the historic aerials and topographic maps and the more recent images, it was clear that although pimple mounds had been present in the past, in most areas pimple mounds appear to have been erased by development and agricultural activities (NETR 2015 and Google Earth 2015).

In addition to the two surveys discussed above, there have been four other surveys conducted within the one-kilometer buffer zone surrounding the APE (THC 2015). Two have occurred near the northern terminus of the project, including a 1986 survey conducted by TxDOT and a 1997 survey conducted by the Texas Water Development Board (TWDB); no more information was forthcoming on the TxDOT survey (THC 2015). The TWDB survey included a series of investigations along FM 2100 and FM 1960 as part of a sewer overflow abatement program. Several prehistoric and historic sites were identified during these investigations, although none of the identified sites are located within the APE or buffer area (Hubbard 1997). Surveys recorded near the southern end of the APE include a joint 1982 Environmental Protection Agency and Texas Department of Water Resources (now TWDB) survey and a 2002 City of Crosby MUD survey (THC 2014). No other information is available for the 1982 survey, although site 41HR501 was recorded during that investigation (see below). BHE Environmental, Inc., conducted a survey for a one-acre area on MUD property for a new wastewater module that would be located adjacent to (330 ft from) site 41HR501; no cultural remains were encountered (Garcia-Herreros and Mason 2004).

One archeological site, a historic cemetery, and a historical marker are recorded within the one-kilometer buffer zone (THC 2015). Site 41HR501 is a prehistoric, possibly Archaic, site recorded in 1982 during the above-mentioned survey conducted by TWDB (THC 2015). Little data was forthcoming other than the site was on an open terrace and it lacked ceramics; recommendations were made that the site be tested for depth of deposits and eligibility (Whitsett 1982). The site currently has undetermined eligibility (THC 2015).

The Hollingsworth Family Cemetery (also known as the Lynch and Jackson Cemetery; HR-C126) is located 0.5 mile (0.8 km) south of the APE. According to the Atlas, it was established in 1914 and used until 1946 (THC 2015). However, a marker in the cemetery for Sarah Merriman Jackson and her husband Humphrey as well as their children notes that Sarah and Humphrey died in 1823 and 1833, respectively (Tipton 2015); whether they are actually interred here is unknown. The Lynch name comes from the interment of Larry Lynch in 1909 (Tipton 2015). The actual number of interments is also uncertain, as the Atlas lists six and Tipton records 10. The historic marker acknowledges Sarah and Humphrey Jackson as members of Stephen Austin's "Old 300" colony established in 1823 and settled east of the San Jacinto River. The Jackson grant opened up the San Jacinto District for additional Anglo settlement (THC 2015).

3.0 RESEARCH GOALS AND METHODS

Purpose of the Research

The present study was carried out to accomplish three major goals:

1. To identify all historic and prehistoric archeological resources located within the APE defined in Chapter One;
2. To perform a preliminary evaluation of the identified resources' potential for inclusion in the NRHP and/or for designation as a SAL (typically performed concurrently); and
3. To make recommendations about the need for further research concerning the identified resources based on the preliminary NRHP/SAL evaluation and with guidance on methodology and ethics from the THC and CTA.

Section 106 of the National Historic Preservation Act

Section 106 of the NHPA of 1966, as amended (16 USC 470; 36 CFR 800), directs federal agencies and entities using federal funds to "take into account the effect of their undertakings on historic properties" (36 CFR 800.1a), with "historic property" defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places [NRHP] maintained by the Secretary of the Interior" (36 CFR 800.16).

In order to determine the presence of historic properties (with this phrase understood in its broad Section 106 sense) an APE is first delineated. The APE is the area in which direct impacts (and in a federal context, indirect impacts as well) to historic properties may occur. Within the APE, resources are evaluated to determine whether they are eligible for inclusion in the NRHP, and to determine the presence of any properties that are already listed on the NRHP. To determine whether a property is significant, cultural resource professionals and regulators evaluate the resource using these criteria:

> . . . The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association and
>
> a. that are associated with events that have made a significant contribution to the broad patterns of our history; or
> b. that are associated with the lives of persons significant in our past; or
> c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d. that have yielded or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Note that significance and NRHP eligibility are determined by two primary components: integrity *and* one of the four types of association and data potential listed under 36 CFR 60.4(a-d). The criterion most often applied to archeological sites is the last—and arguably the broadest—of the four; its phrasing allows regulators to consider a broad range of research questions and analytical techniques that may be brought to bear (36 CFR 60.4[d]).

Occasionally, certain resources fall into categories which require further evaluation using one or more of the following Criteria Considerations. If a resource is identified and falls into one of these categories, the Criteria Considerations listed below may be applied in conjunction with one or more of the four National Register criteria listed above:

a. A religious property deriving primary significance from architectural or artistic distinction or historical importance, or
b. A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event, or
c. A birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his or her productive life, or
d. A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events, or
e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived, or
f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance, or
g. A property achieving significance within the past 50 years if it is of exceptional importance (36 CFR 60.4).

Resources that are listed in the NRHP or are recommended eligible are treated the same under Section 106, and are generally treated the same at the state level as well.

After cultural resources within the APE are identified and evaluated, effects evaluations are completed to determine whether the proposed project has no effect, no adverse effect, or an adverse effect on these resources. Effects are determined by assessing the impacts that the proposed project will have on the characteristics that make the property eligible for listing in the NRHP as well as its integrity. Types of potential adverse effects considered include physical impacts, such as the destruction of all or part of a resource; property acquisitions that adversely

impact the historic setting of a resource, even if built resources are not directly impacted; noise and vibration impacts evaluated according to accepted professional standards; changes to significant viewsheds; and cumulative effects that may occur later in time. If the project will have an adverse effect on cultural resources, measures can be taken to avoid, minimize, or mitigate this adverse effect. In some instances, changes to the proposed project can be made to avoid adverse effects. In other cases, adverse effects may be unavoidable, and mitigation to compensate for these impacts will be proposed and agreed upon by consulting parties.

Antiquities Code of Texas

Because the project is currently owned and funded by TxDOT Houston District, a political subdivision of the State of Texas, the project is subject to the Antiquities Code of Texas (9 TNRC 191), which requires consideration of effects on properties designated as—or eligible to be designated as—SALs, which are defined as:

> . . . sites, objects, buildings, structures and historic shipwrecks, and locations of historical, archeological, educational, or scientific interest including, but not limited to, prehistoric American Indian or aboriginal campsites, dwellings, and habitation sites, aboriginal paintings, petroglyphs, and other marks or carvings on rock or elsewhere which pertain to early American Indian or other archeological sites of every character, treasure imbedded in the earth, sunken or abandoned ships and wrecks of the sea or any part of their contents, maps, records, documents, books, artifacts, and implements of culture in any way related to the inhabitants, prehistory, history, government, or culture in, on, or under any of the lands of the State of Texas, including the tidelands, submerged land, and the bed of the sea within the jurisdiction of the State of Texas. (13 TAC 26.2)

Rules of practice and procedure for the evaluation of cultural resources as SALs and/or for listing on the NRHP, which is also explicitly referenced at the state level, are detailed at 13 TAC 26. An archeological site identified on lands owned or controlled by the State of Texas may be of sufficient significance to allow designation as a SAL if at least one of the following criteria applies:

1. the site has the potential to contribute to a better understanding of the prehistory and/or history of Texas by the addition of new and important information;
2. the site's archeological deposits and the artifacts within the site are preserved and intact, thereby supporting the research potential or preservation interests of the site;
3. the site possesses unique or rare attributes concerning Texas prehistory and/or history;
4. the study of the site offers the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge;
5. the high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is needed to insure [sic] maximum legal protection, or alternatively further investigations are needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected (13 TAC 26.10).

For archeological resources, the state-level process requires securing and maintaining a valid Texas Antiquities Permit from the THC, the lead state agency for Antiquities Code compliance, throughout all stages of investigation, analysis, and reporting.

Survey Methods and Protocols

With the goals and guidelines above in mind, CMEC personnel conducted an intensive survey on April 20 and July 21-22, 2015, per category 6 under 13 TAC 26.15 and using the definitions in 13 TAC 26.3, searching for previously identified and unidentified archeological sites. Field methods complied with the coverage requirements of 13 TAC 26.15, as elaborated by the THC and CTA, as well as applicable TxDOT standards.

A review of the Houston PALM reveals that the majority of the APE (168.18 acres) falls within Map Unit 4. Within this unit, no survey is recommended due to the occurrence of Pleistocene landforms, urban land, and/or dredge spoil. There are, however, four small sections of the APE between Reidland Road and Beckman Drive, totaling 35.8 acres, that fall within Map Unit 2A, where surface survey of mounds only is recommended, and 0.02 acres of Map Unit 1, where both deep trenching and surface survey is recommended (**Figures 3a-f**; Abbott 2001). In addition, based on the previous study of the area (McWilliams 2005), areas that were noted to have possible "historic locales" based on historic maps were carefully examined.

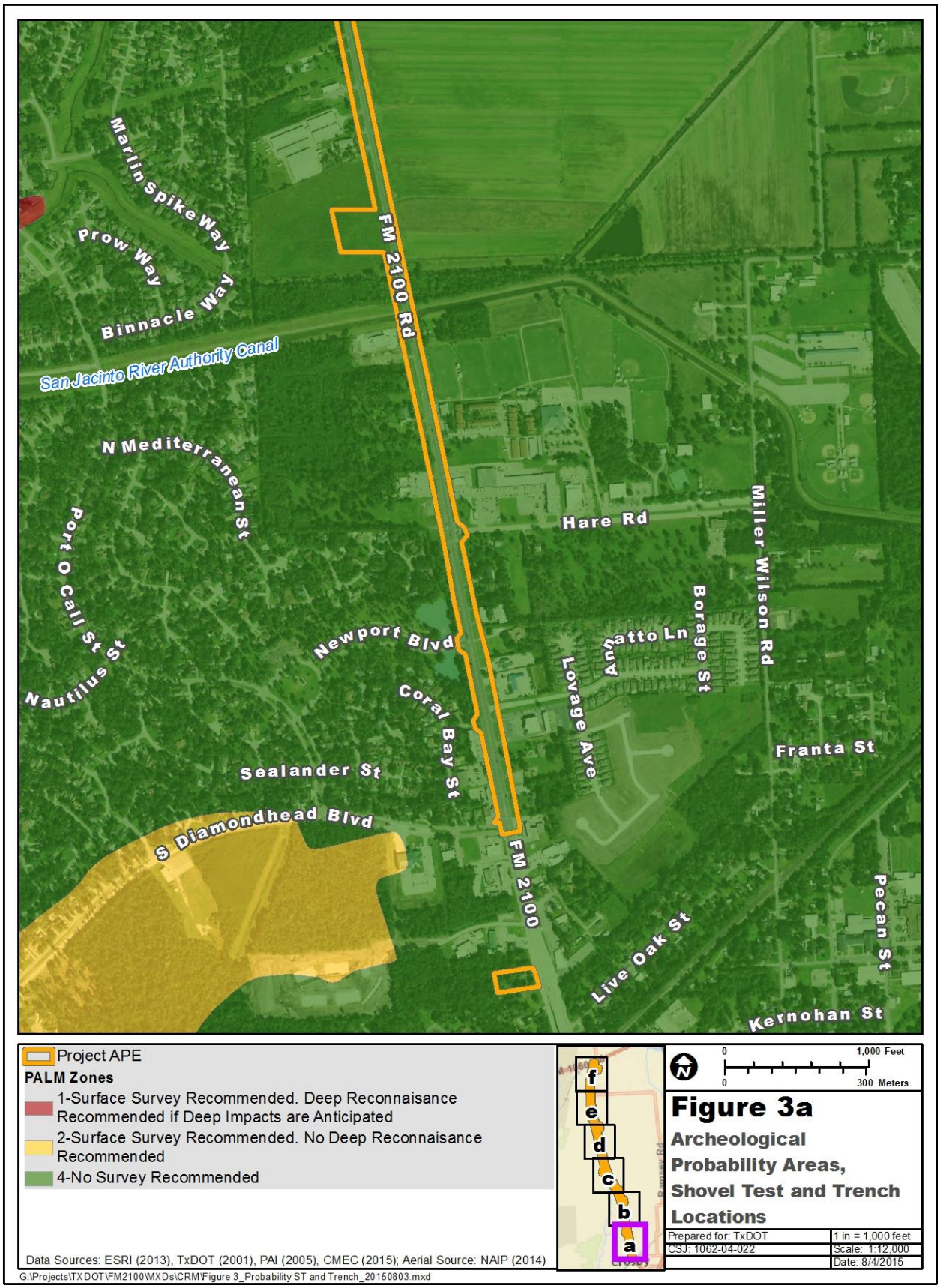
Marlin Spike Way
Prow Way
Binnacle Way
San Jacinto River Authority Canal
FM 2100 Rd
N Mediterranean St
Port O Call St
Nautilus St
Newport Blvd
Coral Bay St
Sealander St
S Diamondhead Blvd
FM 2100
Hare Rd
Miller Wilson Rd
Borage St
Annatto Ln
Lovage Ave
Franta St
Pecan St
Live Oak St
Kernohan St
Project APE
PALM Zones
1-Surface Survey Recommended. Deep Reconnaisance Recommended if Deep Impacts are Anticipated
2-Surface Survey Recommended. No Deep Reconnaisance Recommended
4-No Survey Recommended
Data Sources: ESRI (2013), TxDOT (2001), PAI (2005), CMEC (2015); Aerial Source: NAIP (2014)
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Figure 3a
Archeological Probability Areas, Shovel Test and Trench Locations
Prepared for: TxDOT
CSJ: 1062-04-022
1 in = 1,000 feet
Scale: 1:12,000
Date: 8/4/2015

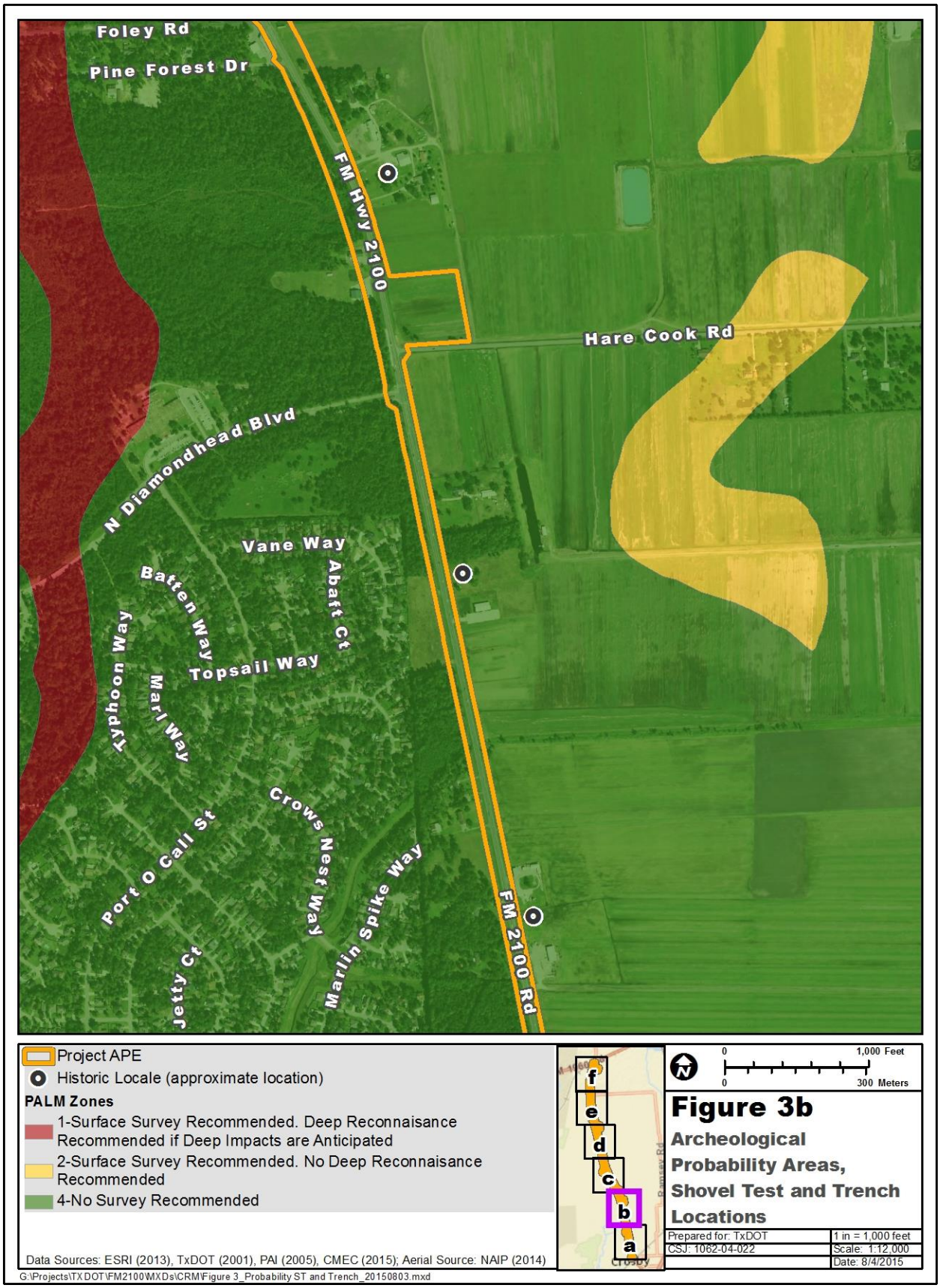
Foley Rd
Pine Forest Dr
FM Hwy 2100
Hare Cook Rd
N Diamondhead Blvd
Vane Way
Batten Way
Abaft Ct
Typhoon Way
Topsail Way
Marl Way
Port O Call St
Crows Nest Way
Marlin Spike Way
Jetty Ct
FM 2100 Rd
Project APE
Historic Locale (approximate location)
PALM Zones
1-Surface Survey Recommended. Deep Reconnaisance Recommended if Deep Impacts are Anticipated
2-Surface Survey Recommended. No Deep Reconnaisance Recommended
4-No Survey Recommended
Data Sources: ESRI (2013), TxDOT (2001), PAI (2005), CMEC (2015); Aerial Source: NAIP (2014)
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Figure 3b
Archeological Probability Areas, Shovel Test and Trench Locations
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CSJ: 1062-04-022
1 in = 1,000 feet
Scale: 1:12,000
Date: 8/4/2015

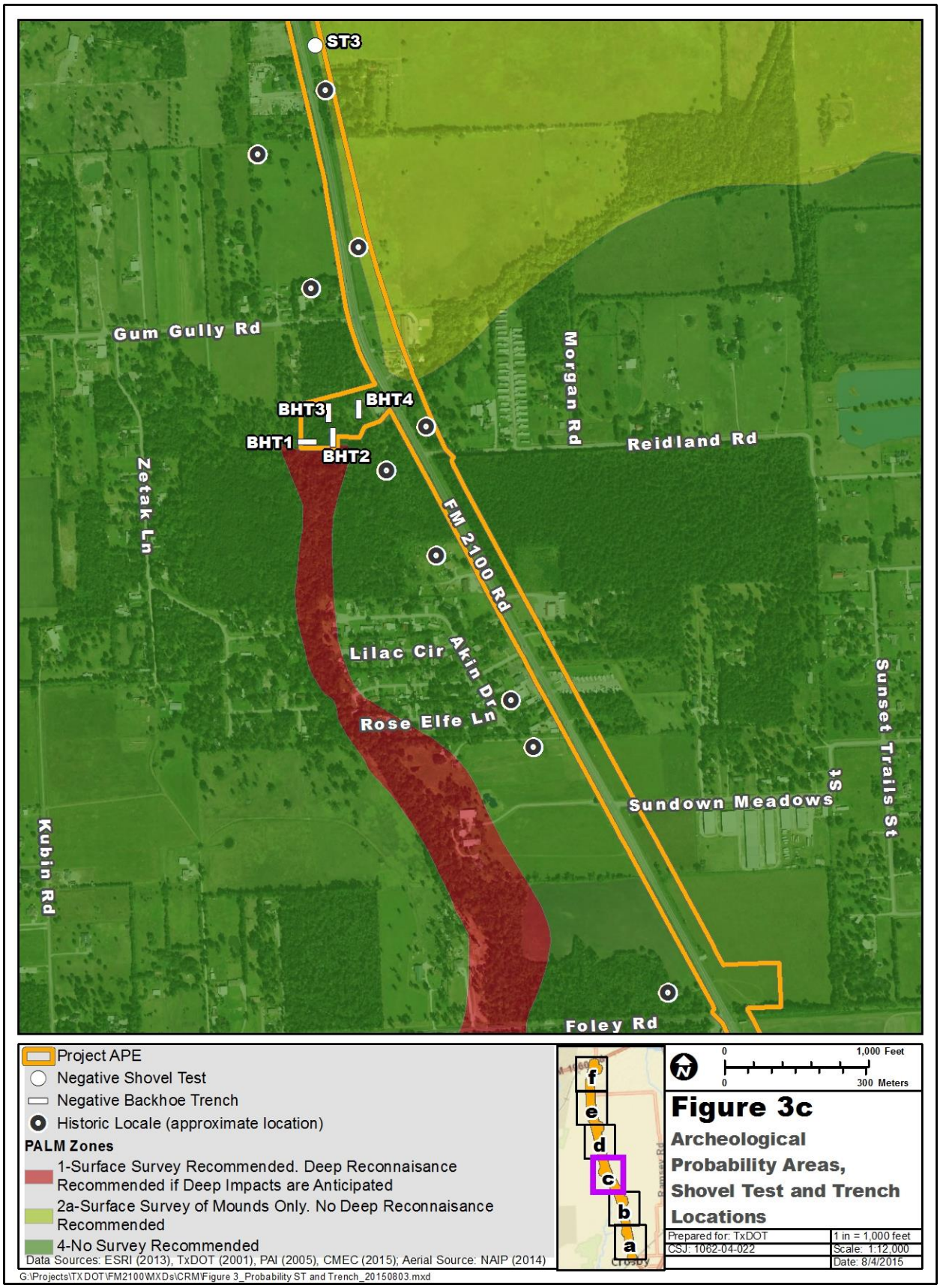
ST3
BHT3
BHT4
BHT1
BHT2
Gum Gully Rd
Morgan Rd
Reidland Rd
Zetak Ln
FM 2100 Rd
Lilac Cir
Akin Drn
Rose Elfe Ln
Sundown Meadows
Sunset Trails St
Kubin Rd
Foley Rd
Project APE
Negative Shovel Test
Negative Backhoe Trench
Historic Locale (approximate location)
PALM Zones
1-Surface Survey Recommended. Deep Reconnaisance Recommended if Deep Impacts are Anticipated
2a-Surface Survey of Mounds Only. No Deep Reconnaisance Recommended
4-No Survey Recommended
Data Sources: ESRI (2013), TxDOT (2001), PAI (2005), CMEC (2015); Aerial Source: NAIP (2014)
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Figure 3c
Archeological Probability Areas, Shovel Test and Trench Locations
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1 in = 1,000 feet
Scale: 1:12,000
Date: 8/4/2015

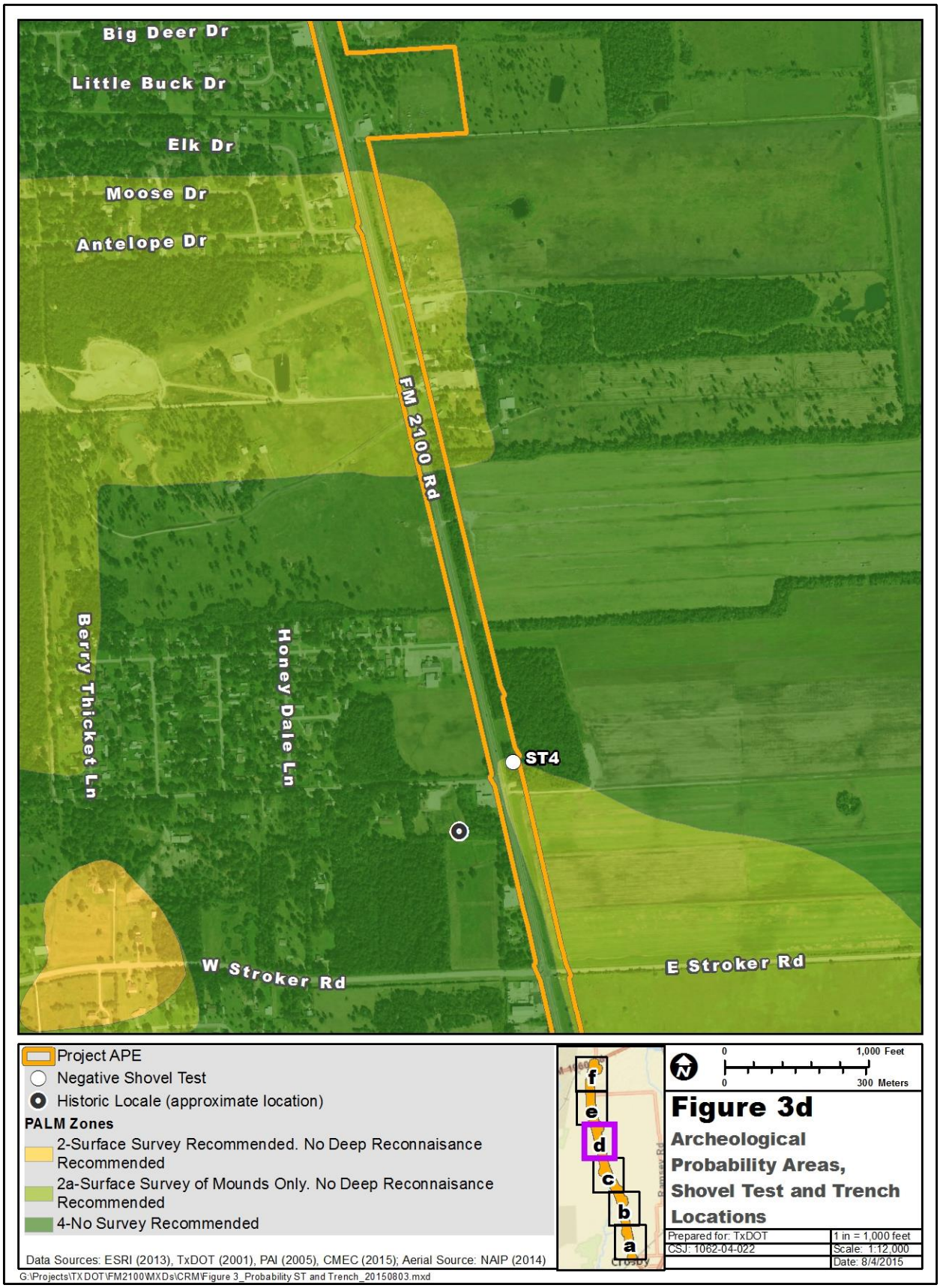
Big Deer Dr
Little Buck Dr
Elk Dr
Moose Dr
Antelope Dr
FM 2100 Rd
Berry Thicket Ln
Honey Dale Ln
ST4
W Stroker Rd
E Stroker Rd
Project APE
Negative Shovel Test
Historic Locale (approximate location)
PALM Zones
2-Surface Survey Recommended. No Deep Reconnaisance Recommended
2a-Surface Survey of Mounds Only. No Deep Reconnaisance Recommended
4-No Survey Recommended
Data Sources: ESRI (2013), TxDOT (2001), PAI (2005), CMEC (2015); Aerial Source: NAIP (2014)
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Figure 3d
Archeological Probability Areas, Shovel Test and Trench Locations
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1 in = 1,000 feet
Scale: 1:12,000
Date: 8/4/2015

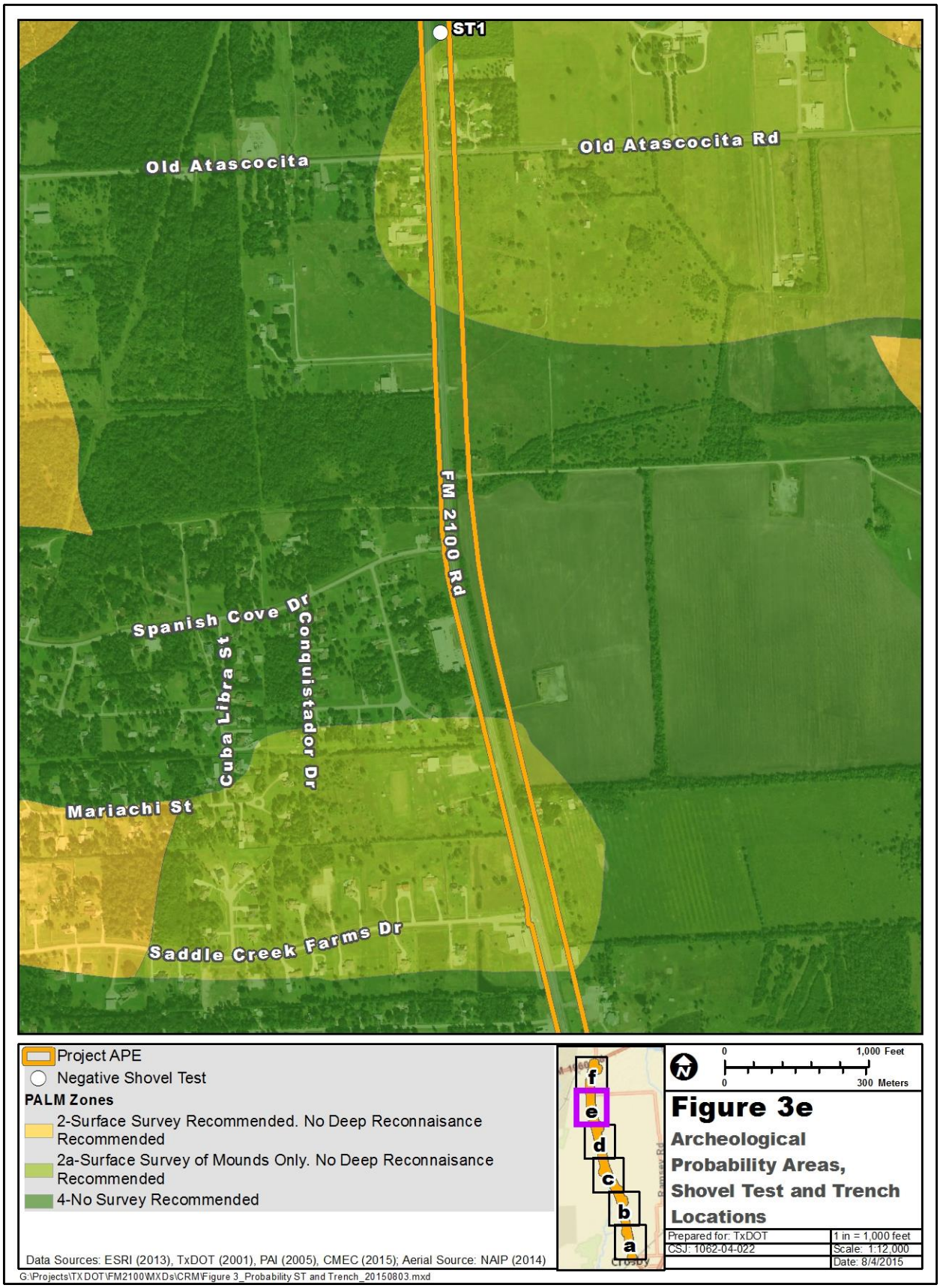
ST1
Old Atascocita
Old Atascocita Rd
FM 2100 Rd
Spanish Cove Dr
Cuba Libra St
Conquistador Dr
Mariachi St
Saddle Creek Farms Dr
Project APE
Negative Shovel Test
PALM Zones
2-Surface Survey Recommended. No Deep Reconnaisance Recommended
2a-Surface Survey of Mounds Only. No Deep Reconnaisance Recommended
4-No Survey Recommended
Data Sources: ESRI (2013), TxDOT (2001), PAI (2005), CMEC (2015); Aerial Source: NAIP (2014)
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Figure 3e
Archeological Probability Areas, Shovel Test and Trench Locations
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Date: 8/4/2015

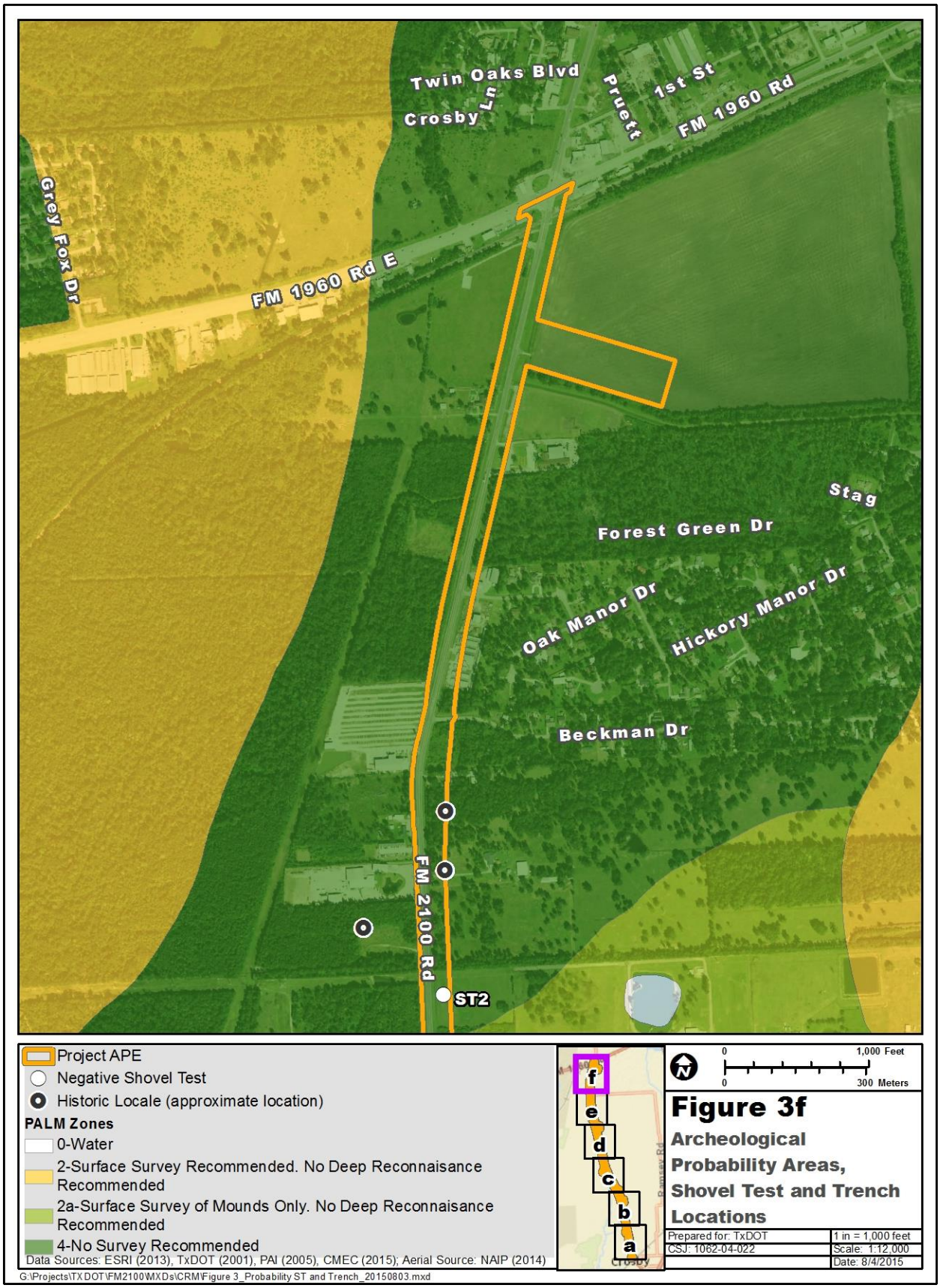
Twin Oaks Blvd
Crosby Ln
Pruett
1st St
FM 1960 Rd
Grey Fox Dr
FM 1960 Rd E
Stag
Forest Green Dr
Oak Manor Dr
Hickory Manor Dr
Beckman Dr
FM 2100 Rd
ST2
Project APE
Negative Shovel Test
Historic Locale (approximate location)
PALM Zones
0-Water
2-Surface Survey Recommended. No Deep Reconnaisance Recommended
2a-Surface Survey of Mounds Only. No Deep Reconnaisance Recommended
4-No Survey Recommended
Data Sources: ESRI (2013), TxDOT (2001), PAI (2005), CMEC (2015); Aerial Source: NAIP (2014)
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Figure 3f
Archeological Probability Areas, Shovel Test and Trench Locations
Prepared for: TxDOT
CSJ: 1062-04-022
1 in = 1,000 feet
Scale: 1:12,000
Date: 8/4/2015

Some portions of the APE were exempt from intensive survey based on the Houston PALM. On those parcels that required intensive survey, excavation of shovel tests was completed according to conditions (i.e., high ground visibility [greater than 50 percent] and/or extensive ground disturbance). Shovel test units were focused in areas identified as Map Units 1, 2a, or at "historic locales" where ground surface visibility was below 30 percent, soils appeared to be of sufficient depth to contain subsurface cultural materials, and/or previous disturbance appeared minimal. All shovel tests were excavated in natural levels to subsoil or 50 cm (20 in), whichever was encountered first. Excavated matrix was screened through 0.635-centimeter (cm) or 0.25-inches (in) hardware cloth as allowed by moisture and clay content, which would have required that the removed sediment be crumbled/sorted by hand, trowel, and/or shovel point. Deposits were described using conventional texture classifications and Munsell color designations, and all observations were recorded on standard CMEC shovel test forms. The testing protocol detailed in the approved scope for TAP 7228 called for radial shovel tests to be placed at 5-m (16-ft) intervals around each shovel test positive for cultural material until two negative units have been established in each cardinal direction, as allowed by project limits, observed disturbance, and other constraints. Deviations from THC and CTA standards were explicitly justified.

Mechanical trenching was conducted on one parcel near Gum Gully. Each trench consisted of a central deep cut flanked by safety benches, with a single continuous exposure along one wall as well as one end of the trench. The center cut measured 3 ft (1 m) across, the width of the bucket. The trenching progressed in 50-cm (20-in) depth increments, and profiles and backdirt was closely examined for the presence of cultural materials and features. The depth goal of the trenching was 3 m (10 ft), as allowed by drainage, soil stability, and other field constraints. The exposed deposits were examined and described using conventional texture classifications and Munsell color designations. All trenches were completely backfilled and leveled at the end of in-field analysis.

Much of the APE is located on privately-owned land; therefore, artifacts found from shovel tests, surface contexts and/or trenches were noted, described, photographed, and returned to their original contexts. At the time of the survey, some landowner permission (less than five) was denied where shovel testing or historic locales were mapped, however, a reasonable and good-faith effort was made to document inaccessible areas from accessible areas for the purposes of the present permit.

All materials (notes, photographs, administrative documents, and other project data) generated from this work will be curated at CAS at Texas State University where they will be made permanently available to future researchers as per 13 TAC 26.16-17.

4.0 RESULTS AND RECOMMENDATIONS

General Field Observations Results

On April 20 2015, CMEC personnel attempted to conduct an intensive archeological survey of the entire 7.7-mile (12.4 km) or 204-ac (83-ha) APE. However, due to excessive rains and extremely wet conditions at that time, an intensive survey was not feasible. However, a reconnaissance survey was conducted to determine the condition of the acreage recommended for intensive survey and whether all of those parcels within the APE would require that level of survey. Ultimately, several parcels were dropped form the intensive survey list due to observed impacts, particularly from sod or turf farming. The intensive survey was conducted on the remaining parcels of proposed new right-of-way and one detention pond on July 21-22, 2015. The intensive survey included both shovel testing and mechanical trenching.

Originally 35.82 acres of the total 204-acre APE were determined as situated within Map Units 1 and 2a where surface survey of pimple mounds and trenching and surface survey is recommended. These areas include the planned detention pond near Reidland Road that crosses into Map Unit 1 and segments of the roadway improvements (between Reidland Road and Beckman Drive) that cross into Map Unit 2a (see **Figures 3c-e**). In addition, areas where new right-of-way is being acquired and where historic locales were identified during the previous survey (see McWilliams 2005) were also examined for archeological remains. A few of the parcels were removed from consideration for intensive survey after the initial reconnaissance survey in April due to previous impacts observed during reconnaissance.

The APE is located in a flat coastal prairie that is still mostly rural, although urban development is gradually encroaching, particularly in Crosby on the southern end of the APE. In addition, much of the project APE has been subjected to ground-disturbing activities associated with agriculture, residential and commercial development, oil and gas storage and transmission activities (**Figure 4**), installation of utilities (**Figure 5**), and construction and maintenance of the existing road and ditches. Turf farming in the APE has resulted in deflated fields (**Figures 6-7**) which has effected the potential for any archeological deposits on several parcels. One current pasture observed had been terraced in the past (**Figure 8**). Crayfish mounds were also observed in several of the parcels indicating damp or wet environmental conditions. In some of the dense wooded areas walked, heavy erosional cuts were observed between the trees and saplings (**Figure 9**). Some dumping of large corrugated pipes and construction debris has occurred in these wooded areas as well.

No obvious historic deposits or remains were observed in the areas where historic locales were previously identified; many of these locales were actually mapped as outside of the current and/or proposed right-of-way (see **Figures 3b-d, f**). No evidence of historic occupation was observed in

those parcels where locales were mapped or reported and access was granted, primarily due to evidence of current or past sod/turf farming and some recent development.

Four shovel tests (ST) were excavated in required PALM map units where no obvious impacts and disturbances were observed. Soils were fairly consistent in these areas consisting of dark brown to black silt loam or silty clay (**Figure 10; Table 2**). Naturally occurring marine shell was observed in all of the shovel tests and in the borrow ditches along the edges of FM 2100 (**Figure 11**). No artifacts or features were observed in any of the shovel tests.

Figure 4. Gas transfer facility in APE; facing north.

Figure 5. Example of utilities and ditches in APE, facing north.

Figure 6. Deflated turf/sod farm in APE; facing south.

Figure 7. Deflated agricultural field in APE; facing north.

Figure 8. Pasture in APE with evidence of old terracing; facing northeast.

Figure 9. Erosional cuts in wooded area in APE; facing north.

Figure 10. Typical marine shell found in soil in APE.

Figure 11. ST 2; typical shovel test profile.

Table 2: Shovel Test Unit Excavation Results

ST #	Depth (cmbs*)	Description/Notes	Artifacts
1	0-10	Very dark grayish brown (10YR 3/2) compact silt loam; full of grass roots	None
	10-25	Very dark gray (10YR 3/1) compact silty clay; ST terminated due to compact soil	None
2	0-8	Very dark grayish brown (10YR 3/2) moist but compact silt loam mottled with dark yellowish brown (10YR 4/6) and dark gray (10YR 4/1) streaks; natually occurring marine shell fragment at base of levelmjust under grass layer	None
	8-48	Very dark brown (10YR 2/2) moist silt loam; ST terminated at depth	None
3	0-46	Black (10YR 2/1) silt loam; natually occurring marine shell and plastic netting found just under grass (neeting from turf farming)	None
4	0-18	Very dark grayish brown (10YR 3/2) clayey silt; roots throughout and naturally occurring marine shell fragments	None
	18-33	Very dark grayish brown to dark brown (10YR 3/2 to 3/3) clayey silt	None
	33-50	Dark gray (10YR 4/1) clayey silt; some roots at 40 cmbs; ST terminated at depth	None

* Centimeters below surface.

The parcel containing the proposed detention pond area requiring mechanical trenching is located immediately adjacent to the north bank of Gum Gully (**see Figure 3c**) about midway along the APE. Most of the parcel, particularly the rear portion, along Gum Gully on the south property line, and the strip along the north property line is heavily wooded. The portion of the parcel facing FM 2100 is in use as a Spanish-speaking Jehovah Witness assembly hall and includes a parking area and church yard. Between the assembly hall building and the wooded area are the remains of an old mobile home/traveling trailer park with extant electric lines and a mounded central septic tank sewer system (**Figures 12-14**). A review of available aerial photographs (1953, 1957, 1960, 1962, 1964, 1966, 1973, 1981, 1995, 2002, 2004, 2010, and 2012) indicate that the parcel was in sparse trees from 1953 until 1981, when the aerial shows it being cleared near the road (NETR 2015). It is possible that the mobile home/traveling trailer park was being constructed at that time. The 1995 aerial shows a large structure, presumably the current assembly hall building, and a few small structures behind it, of which two (a shed and a trailer) are still extant. It is thought that the mobile home/traveling trailer park was no longer being used as such once the church was established, which would indicate that the mobile home/traveling trailer park was in place and potentially utilized between 1981 and sometime before 1995.

Four backhoe trenches (BHT) were excavated within the parcel (see **Figure 3c**), with attention paid to avoid any buried utilities in the center portion of the parcel where the old mobile home/trailer park remnants are located. No shovel tests were excavated in this area either as it was considered previously disturbed. Three of the trenches were placed in the wooded areas where few to no disturbances were thought to have occurred. Each trench was 61 cm (2 ft, the width of the bucket) wide and varied in length between 3.6 and 5 m (11.8 and 16.4 ft) long. The profiles of BHTs 1-3 were consistent showing a profile of dark compact clay over a lighter, very sticky clay with some calcium carbonates over a base layer of what is locally called "white caliche," an extremely friable sandy, shelly clay with numerous calcium carbonates, pebbles, and compact clay nodules interspersed throughout (**Figure 15; Table 3**). An old corrugated water/sewer pipe was encountered in BHT 3 running across the south end of the trench (**Figure 16**). It is possible that this pipe was originally part of the trailer park water or sewer system. BHT 4 was excavated near the front of the property, at the rear of the parking lot and exhibited generally the same profile as the other trenches, but two layers of asphalt and fill dirt with small wiring were noted above the intact profile (**Figure 17**). No artifacts or features were observed in any of the trenches.

Figure 12. Remnants of old mobile home/traveling trailer park; facing southwest.

Figure 13. Remnants of old mobile home/traveling trailer park; facing west.

Figure 14. Close-up of the mounded central septic tank system; facing south.

Figure 15. East wall of BHT 1, typical profile; facing east.

Figure 16. Corrugated pipe encountered in BHT 3; facing north.

Figure 17. West wall profile of BHT 4; note fill and wiring at top of profile; facing west.

Table 3: Backhoe Trench Excavation Results

BHT #	Depth (cmbs*)	Description/Notes	Artifacts
1 5 m long	0-40	Black (2.5Y 2.5/1) compact, slightly moist and friable clay	None
	40-138	Very dark gray (2.5 Y 3/1) moist but exctremely compact and sticky claywith hair-thin streaks of dark yellowish brown (10YR 4/6) clay	None
	138-200	Gray (2.5Y 5/1) compact but friable clay with streaks of light olive brown (2.5Y 5/6) clay; also some occurrences of cakcium carbonates	None
	200-250	White (7.5YR _/1) extrememly friable sandy, shelly clay in compact clay with calcium carbonates and some small pebbles	None
2 4.5 m long	0-17	Very dark brown (10YR 2/2) somewhat friable, slightly moist clay	None
	17-134	Black (2.5Y 2.5/1) moist extremely sticky and compact clay with some calcium carbonates near base	None
	134-209	Very dark gray (10YR 3/1) grading into very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) [no obvious break in colors] sticky clay with more calcium carbonates throughout	None
	209-250	White (7.5YR _/1) with streak of dark yellowish brown (10YR 4/6) friable sandy, shelly claywith hard clay nodules, calcium carbonates, and some pebbles	None

Table 3: Backhoe Trench Excavation Results			
3 4.2 m long	0-60	Black (2.5Y 2.5/1) friable clay; old corrugated water/sewer pipe encounterd at 40-75 cmbs in south end of trench	None
	60-154	Dark gray (2.5Y 4/1) dense clay with streaks of gray (2.5Y 5/1) clay	None
	154-240	Gray (2.5Y 5/1) mixed with light olive brown (2.5Y 5/3) sandy, shelly claywith hard clay nodules, gritty calcium carbonates, and small gravel; friable at base	None
4 3.6 m long	0-20	Black (10YR 2/1) asphalt and gravel mixture; fill (parking lot), small wires in layer	None
	20-30	Very pale brown (10YR 7/3) constuction sand and gravel; fill	None
	30-45	Dark gray (10YR 4/1) constuction sand and small gravel; fill	None
	45-182	Black (10YR 2/1)moist, dense clay	None
	182-240	Very dark gray (2.5Y 3/1) mixed with gray (2.5Y 5/1) moist, compact clay	None
	240-258	White (N 9.5/) very friable clay with gravels, calcium carbonates, and small clay nodules	None
* Centimeters below surface			

Recommendations

As the majority of the APE falls within a PALM map unit that required no survey, and weather limited early attempts to conduct an intensive survey, a reconnaissance of the APE was undertaken prior to a July intensive survey. The reconnaissance as well as the intensive survey indicates that extensive disturbances within the APE due to previous construction activities, utility installation, commercial and residential development, and farming practices have greatly affected the potential for identifying any intact archeological deposits. No evidence was found of preserved deposits with a high degree of integrity; associations with distinctive architectural and material culture styles; rare materials and assemblages; the potential to yield data important to the study of preservation techniques and the past in general; or potential attractiveness to relic hunters (13 TAC 26.10; 36 CFR 60.4). No additional archeological investigations are warranted prior to construction activities.

No artifacts were collected, therefore, only project records will need to be curated per TAC 26.16 and 26.17. Project records will be curated at the CAS Texas State University where they will be made permanently available to future researchers.

If any unanticipated cultural materials or deposits are found at any stage of clearing, preparation, or construction, the work should cease in that area and TxDOT personnel should be notified immediately. During evaluation of any unanticipated finds and coordination between TxDOT and THC, clearing, preparation, and/or construction could continue in any other areas along the corridor where no such deposits or materials are observed.

5.0 REFERENCES

Abbott, J.T.

2001 Houston Area Geoarcheology: A Framework for Archeological Investigation, Interpretation, and Cultural Resource Management in the Houston Highway District. Environmental Affairs Division Archeological Studies Program Report 27. Texas Department of Transportation. Austin.

Aten, L.E.

1983 *Indians of the Upper Texas Coast*. Academic Press, New York.

Bureau of Economic Geology (BEG)

1979 *Geological Atlas of Texas, Seguin Sheet. University of Texas at Austin*. Available at http://twbd.state.tx.us/groundwater/acquifer/GAT/seguin.htm. Accessed January 15, 2015.

1982 *Geological Atlas of Texas, Houston Sheet*. University of Texas at Austin. Available at http://twbd.state.tx.us/groundwater/acquifer/GAT/houston.htm. Accessed January 15, 2015.

Ensor, H.B.

1991 *Archeological and Historic Investigations of the Harris County Lease in Barker Reservoir, Harris County, Texas*. Reports of Investigations No. 2. Archeological Research Laboratory, Texas A&M University, College Station.

Garcia-Herreros, J., and J.B. Mason

2004 *Phase I Cultural Resource Management Survey of a Site in the City of Crosby*. BHE Environmental, Inc., Houston.

Gould, F.W., G.O. Hoffman, and C.A. Rechenthin

1960 *Vegetational Areas of Texas*. Texas Agricultural Experiment Station Leaflet No. 492. Texas A&M University, College Station.

Griffith, G.E., S.A. Bryce, J.M Omernik, J.A. Comstock, A.C. Rodgers, B. Harrison, S.L. Hatch, and D. Bezanson

2004 *Ecoregions of Texas*. U.S. Geological Survey, United States Department of the Interior, Washington, D.C.

Henson, M.S.

2010 "HARRIS COUNTY." *Handbook of Texas Online* available at http://www.tshaonline.org/handbook/online/articles/hch07. Accessed July 2, 2015.

Hubbard, N.

1997 Archeological Investigations and Assessments of Wastewater Facilities Improvement Projects for the State Water Pollution Revolving Fund Program, SRF Project Number 2834-07, City of Houston, Harris County, Texas. Report of Investigations No. 1. Greenstone Geoscience, Houston.

Kenmotsu, N.A., and T.K. Perttula (editors)
1993 *Archeology in the Eastern Planning Region, Texas: A Planning Document.* Department of Antiquities Protection Cultural Resource Management Report 3, Texas Historical Commission, Austin.

Kleiner, D.J.
2010 "HUFFMAN, TX." *Handbook of Texas Online* available at http://www.tshaonline.org/handbook/online/articles/hnh49. Accessed on July 2, 2015.

McMahan, C.A., R.G Frye, and K.L. Brown
1984 *The Vegetation Types of Texas Including Cropland.* Wildlife Division, Texas Parks and Wildlife Department, Austin.

McWilliams, J.
2005 *Archeological Survey for Widening of FM 2100, Harris County, Texas.* Prewitt and Associates, Inc., Report of Negative Archeological Survey Letter Report No 732. Prewitt and Associates Inc., Austin.

Natural Resources Conservation Service (NRCS)
2015 NRCS SSURGO and STATSGO soil data viewed through SoilWeb KMZ interface for Google Earth, available at http://casoilresource.lawr.ucdavis.edu/soilweb/. U.S. Department of Agriculture and California Soil Resource Laboratory, University of California, Davis. Accessed January 15, 2015.

Nationwide Environmental Title Research (NETR)
2015 Historic Aerials Database. Nationwide Environmental Title Research. Available at http://historicaerials.com. Accessed January 15, 2015, and July 24, 2105.

Patterson, L.W.
1995 The Archeology of Southeast Texas. *Bulletin of the Texas Archeological Society* 66:239-264.

Pertulla, T.K.
2004 An Introduction to Texas Prehistoric Archeology. In *The Prehistory of Texas*, edited by T. K. Perttula, pp. 5- 14. Texas A&M University Press, College Station.

San Jacinto River Authority
2010 "San Jacinto River Authority." *Handbook of Texas Online*. Article uploaded June 15, 2010. Accessed January 16, 2015.

Scott, T.
2009 Archeological Survey of the Proposed Crosby M.U.D. Wastewater Utility Project in Harris County, Texas. HRA Gray & Pape, LLC, Houston.

Smith, T.N.
2010 "CROSBY, TX." *Handbook of Texas Online* available at http://www.tshaonline.org/handbook/online/articles/hgc18. Accessed on July 2, 2015.

Story, D.A., J.A. Guy, B.A. Burnett, M.D. Freeman, J.C. Rose, D.G. Steele, B.W. Olive, and K.J. Reinhard

1990 *The Archeology and Bioarcheology of the Gulf Coastal Plain, Volume 1*. Arkansas Archeological Survey Research Series No. 38. Arkansas Archeological Survey, Fayetteville.

Texas Almanac

2015 "Physical Regions of Texas." Texas Almanac. Available at http://texasalmanac.com/topics/environment/physical-regions-texas. Accessed January 15, 2015.

Texas Historical Commission (THC)

2015 *Texas Archeological Sites Atlas Data Sets*. Texas Historical Commission and the Texas Archeological Research Laboratory. Available at http://nueces.thc.state.tx.us. Accessed January 15, 2015

Texas Parks and Wildlife (TPWD)

2011 *Ecoregions of Texas*. Texas Parks and Wildlife. Available at https://tpwd.texas.gov/landwater/land/maps/gis/map_downloads/map_gallery/bio/. Downloaded January 15, 2015.

Tipton, J.

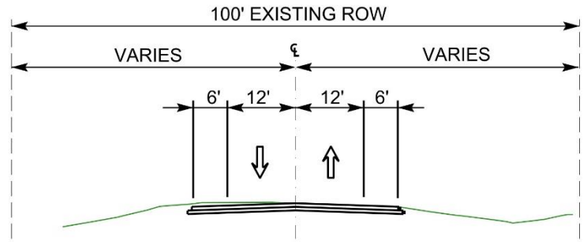
2015 *Find a Grave Cemetery Database – Lynch Cemetery, Harris County, Texas*. Available at http:/findagrave.com. Accessed January 15, 2015.

Whitsett, W.H.

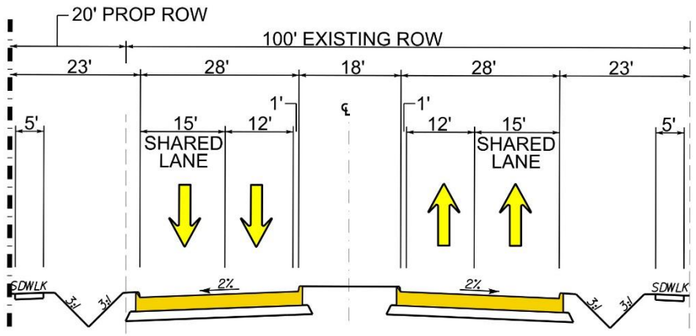
1982 41HR501 Texas Archeological Site Form. Available at http://nueces.thc.state.tx.us. Accessed November 20, 2014.

Appendix A

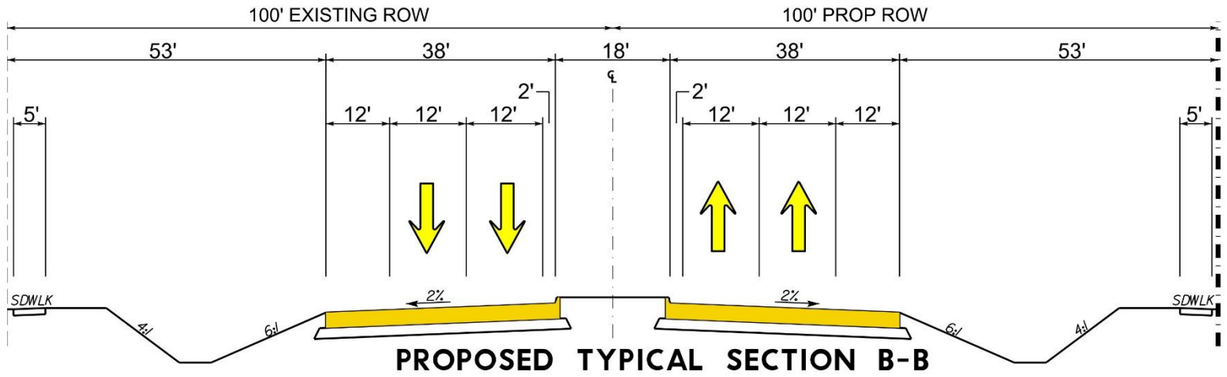
Design Documents



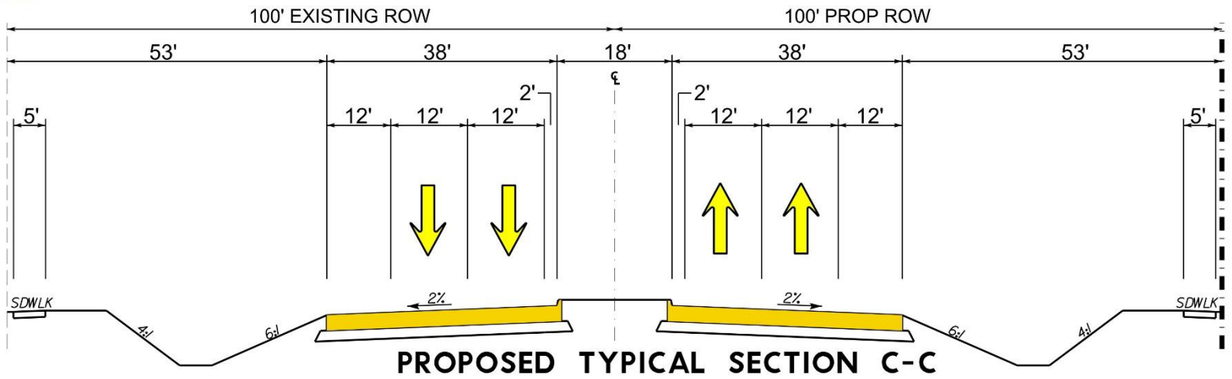
FM 2100 EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION A-A



PROPOSED TYPICAL SECTION B-B



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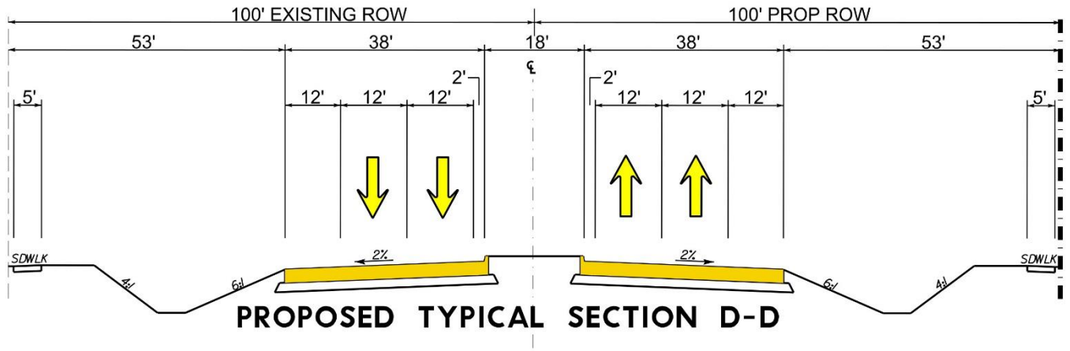


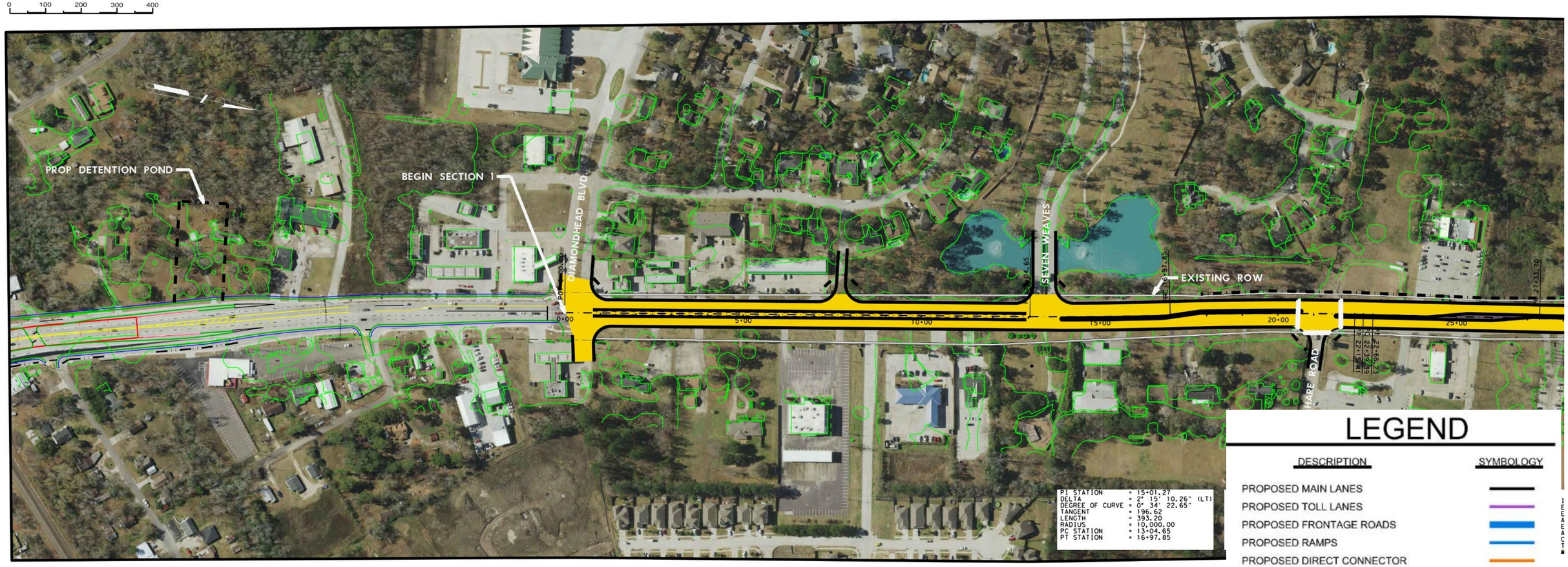
PROPOSED TYPICAL SECTION D-D

Figure 3

Typical Sections

FM 2100 from FM 1960 to S Diamondhead Blvd

CSJ: 1062-04-022



LEGEND

DESCRIPTION	SYMBOLOGY
PROPOSED MAIN LANES	
PROPOSED TOLL LANES	
PROPOSED FRONTAGE ROADS	
PROPOSED RAMPS	
PROPOSED DIRECT CONNECTOR	
PROPOSED EMBANKMENT	
PROPOSED RETAINING WALL	
PROPOSED BRIDGE BENTS	
PROPOSED NOISE WALL	
PROPOSED SIDEWALKS	
PROPOSED STRIPING	
PROPOSED LANE INDICATOR	
PROPOSED RIGHT-OF-WAY	
CONTROL OF ACCESS	
PLANIMETRIC	
EXISTING RIGHT-OF-WAY	
EXISTING ROADWAY	
EXISTING ROADWAY TO BE REMOVED	
EXISTING LANE INDICATOR	
TRAFFIC COUNT YEAR (2035) DHV	<200>
TRAFFIC COUNT YEAR (2015) DHV	200

COLORFILL LEGEND

MAIN LANES	
MEDIAN	

Figure 4a

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

CSJ: 1062-04-022

Figure 4b

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

CSJ: 1062-04-022

Figure 4c

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

CSJ: 1062-04-022

Figure 4d

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

CSJ: 1062-04-022

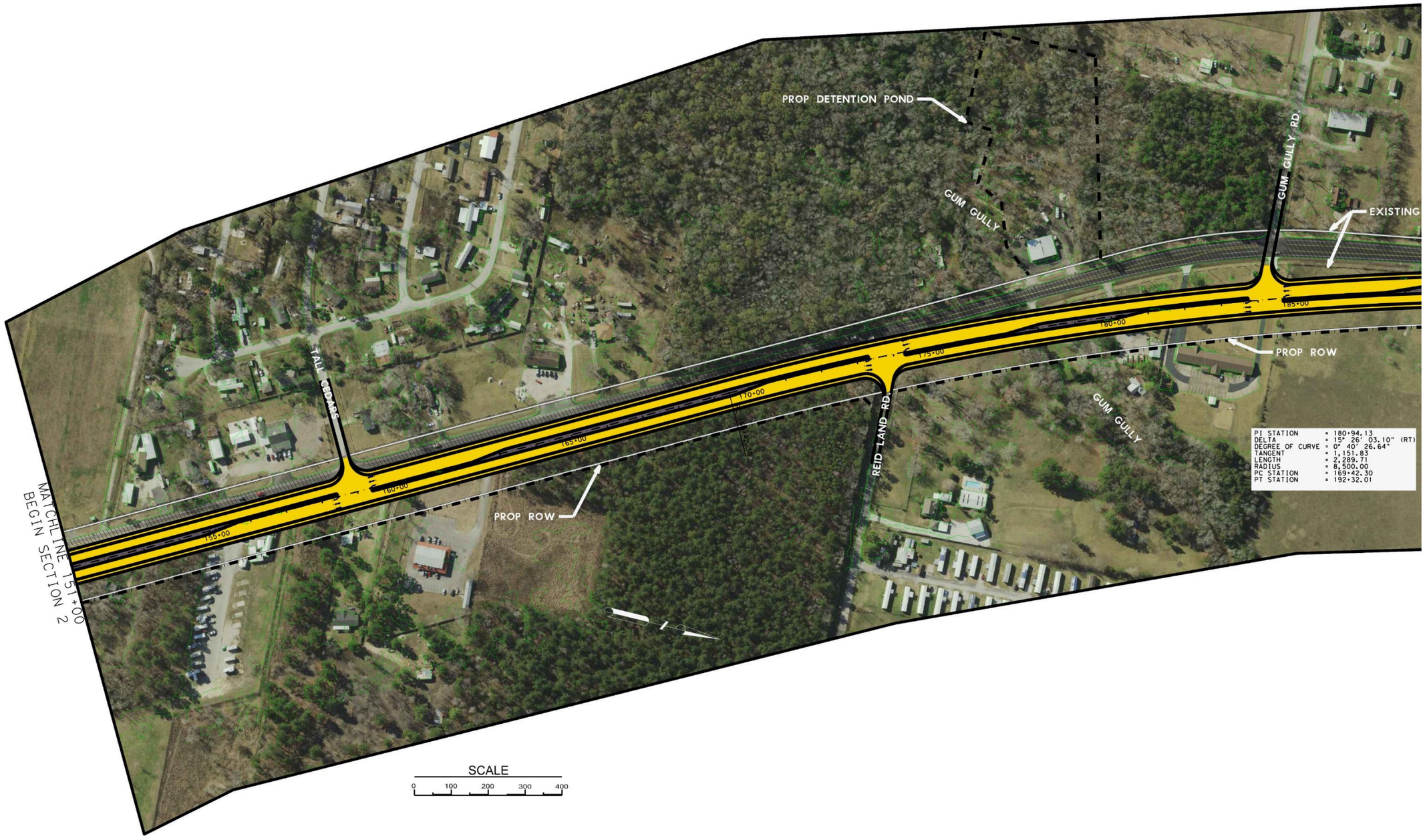


Figure 4e

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

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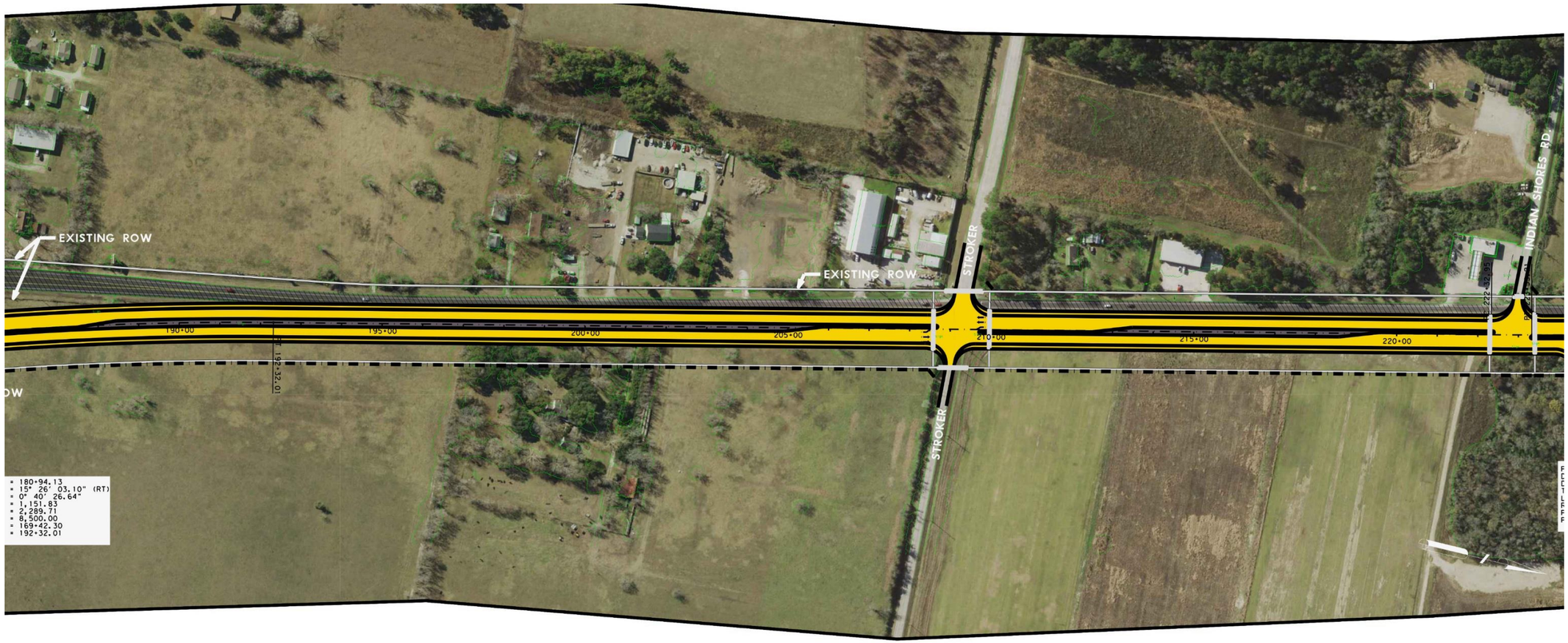

Figure 4f

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

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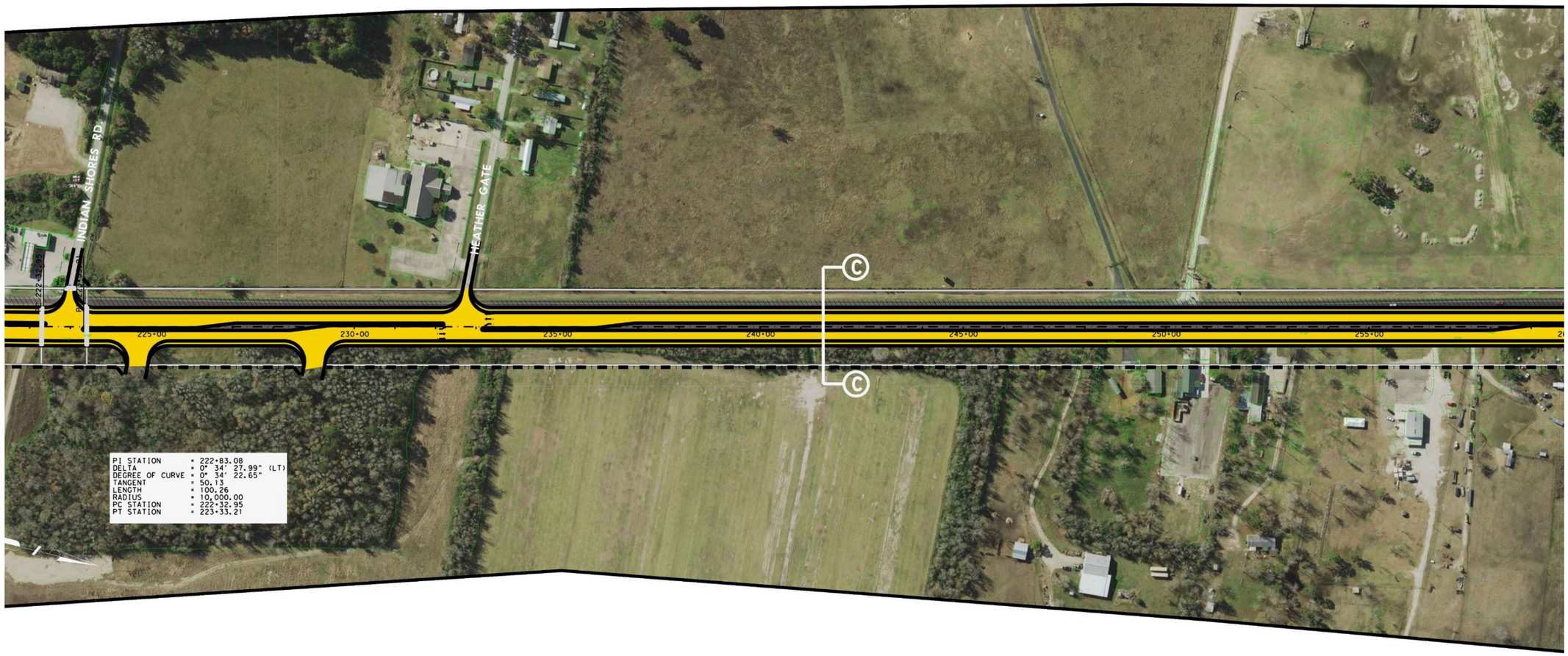

Figure 4g

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

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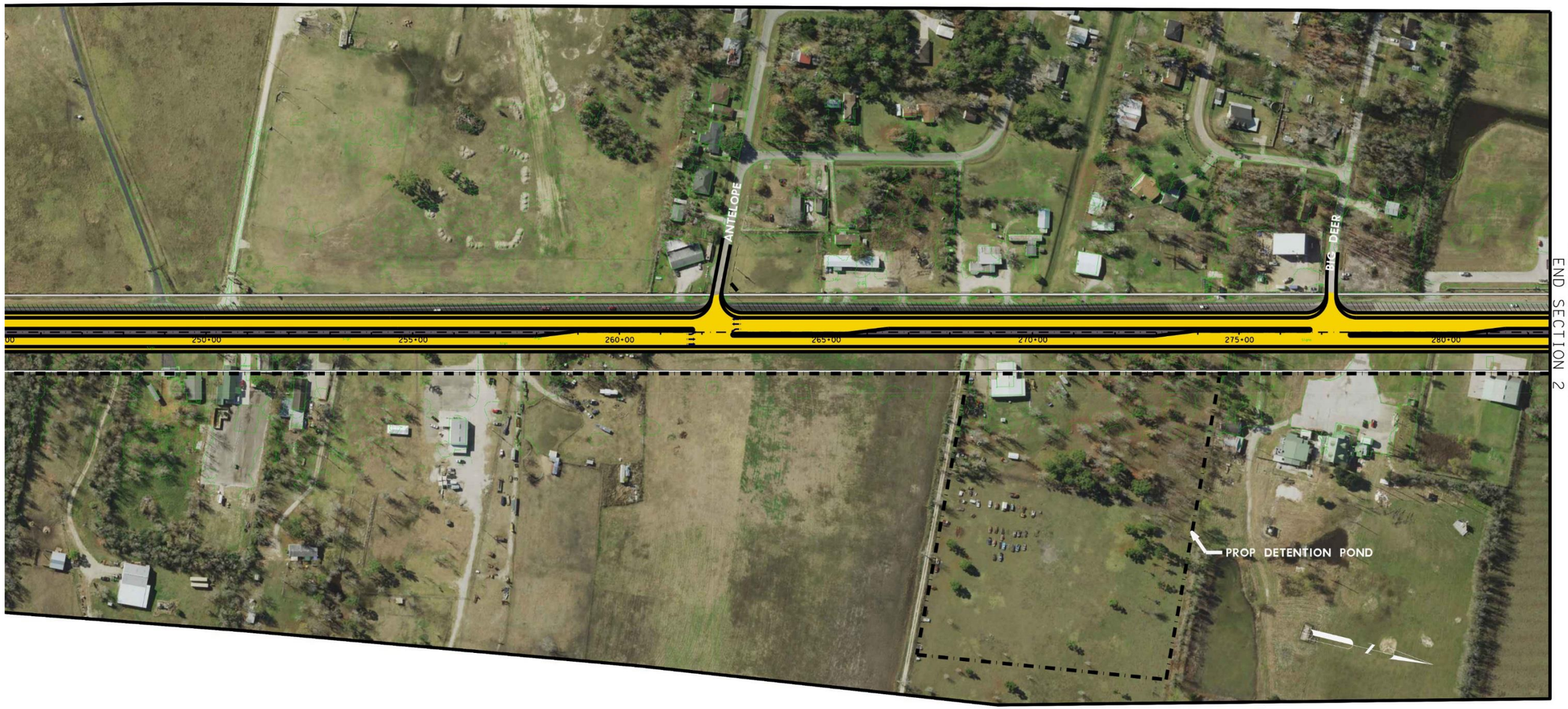

Figure 4h

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

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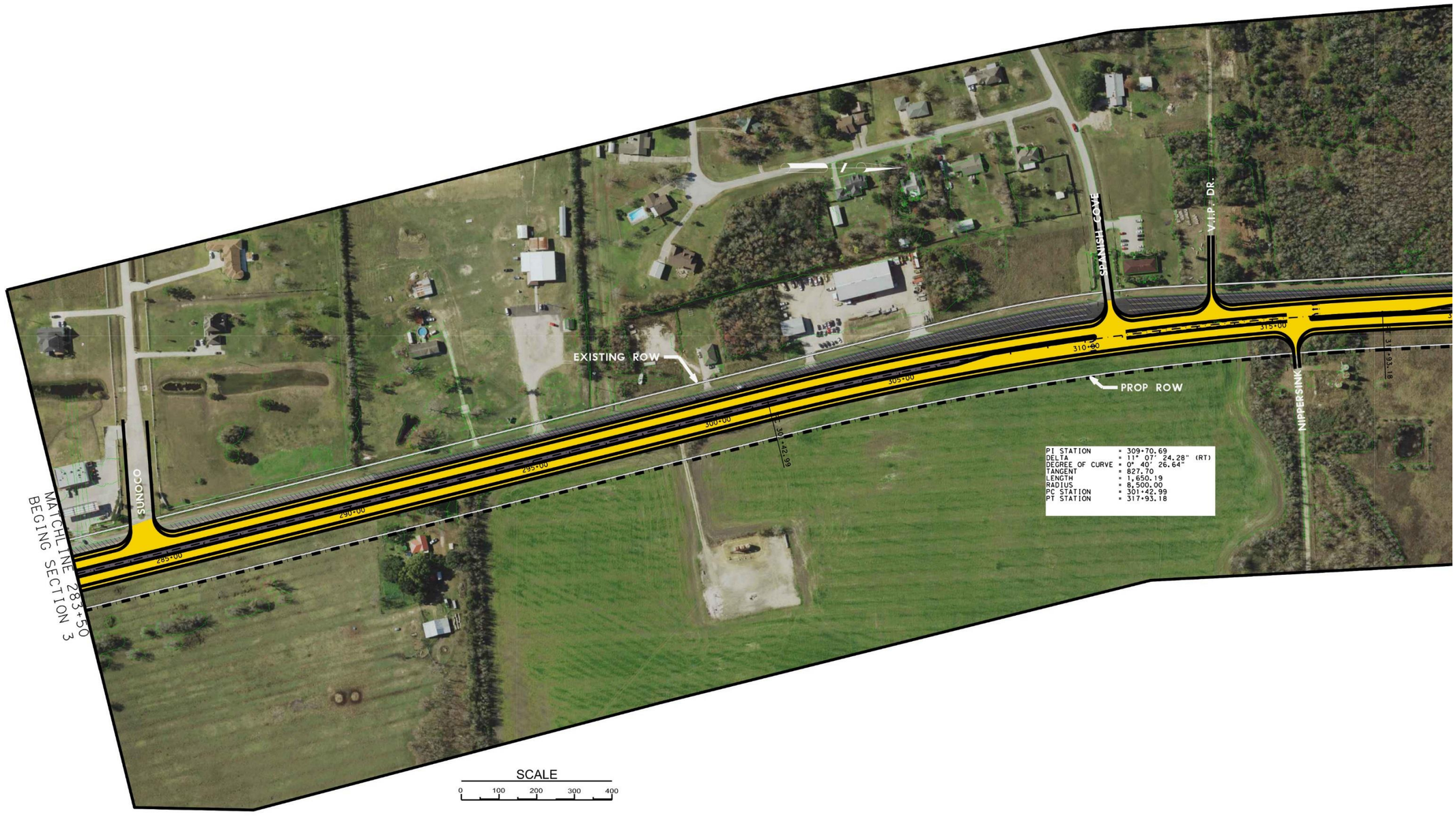

Figure 4i

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

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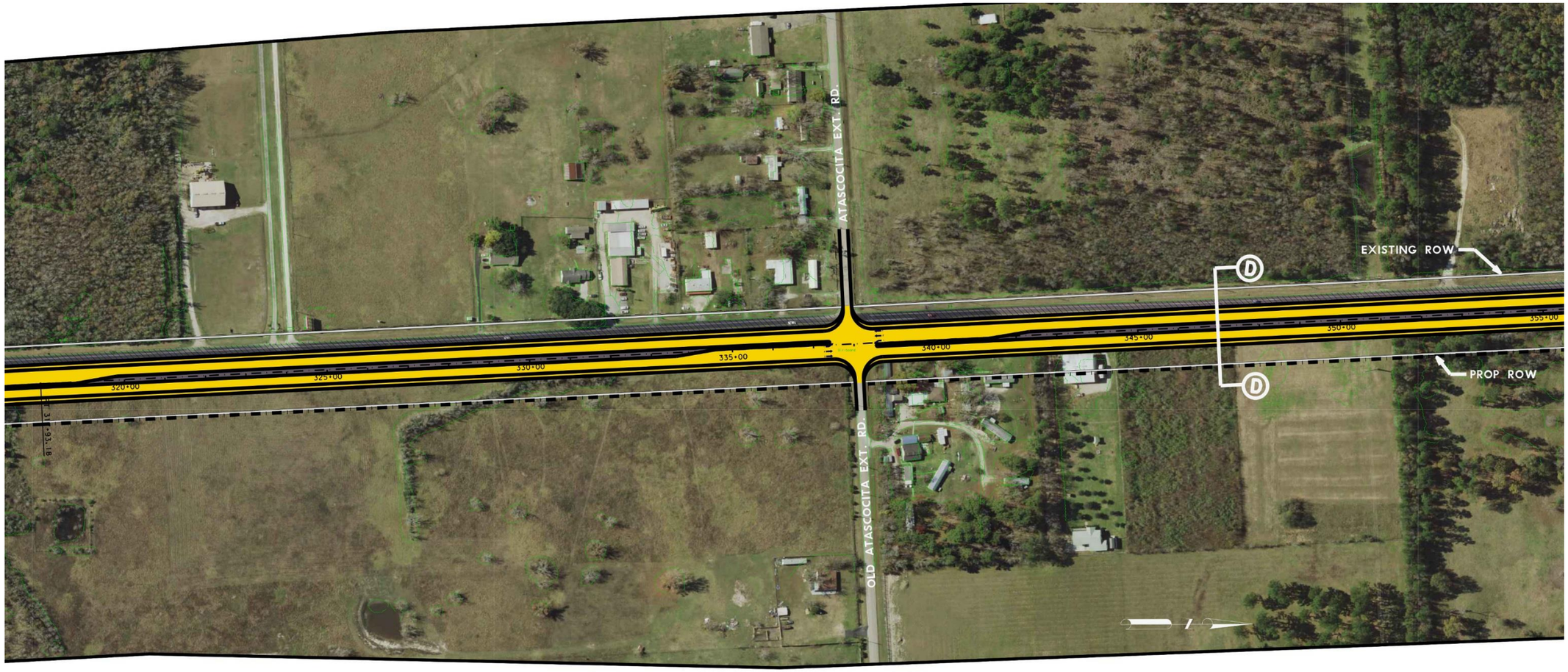

Figure 4j

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

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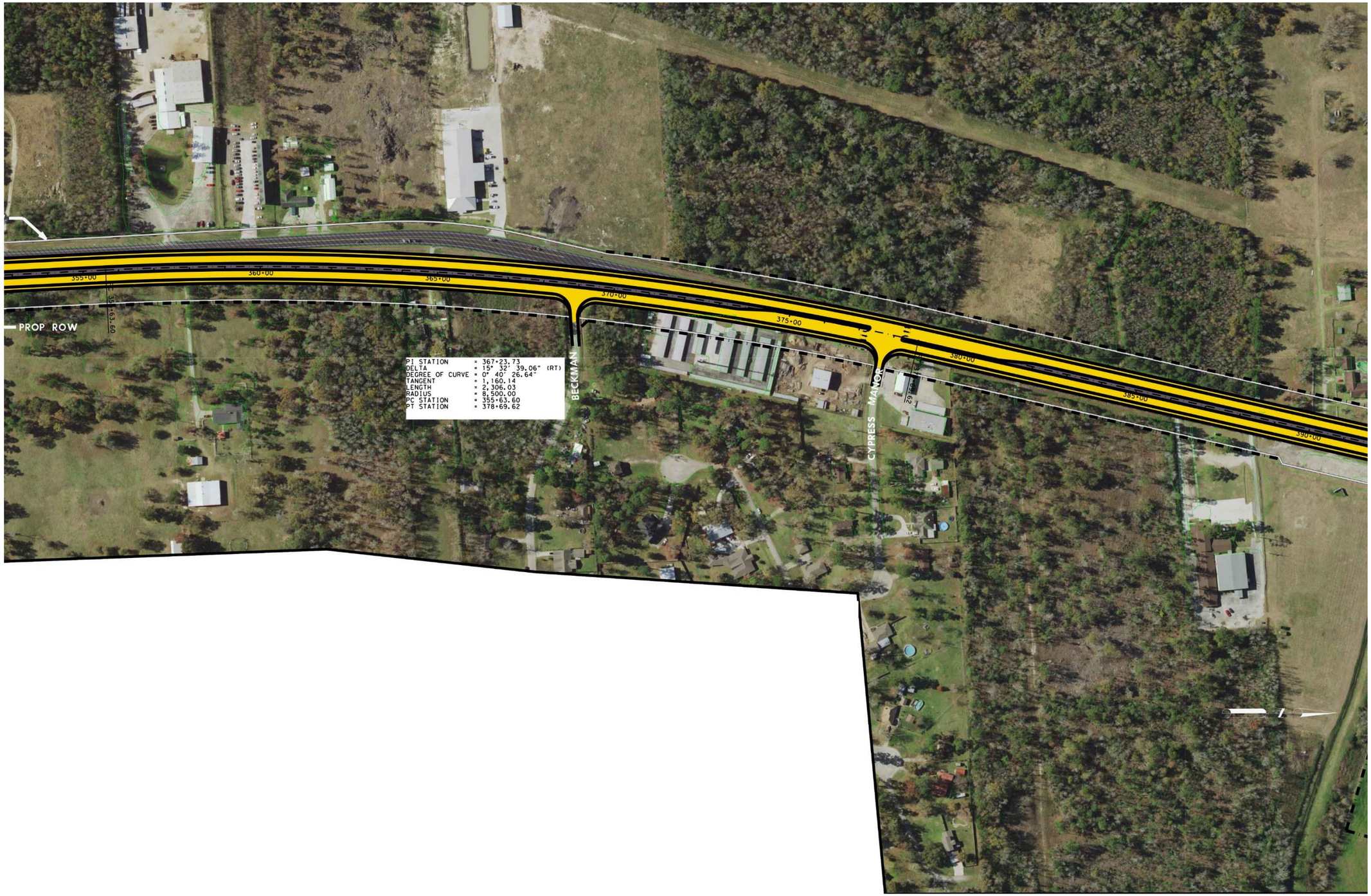

Figure 4k

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

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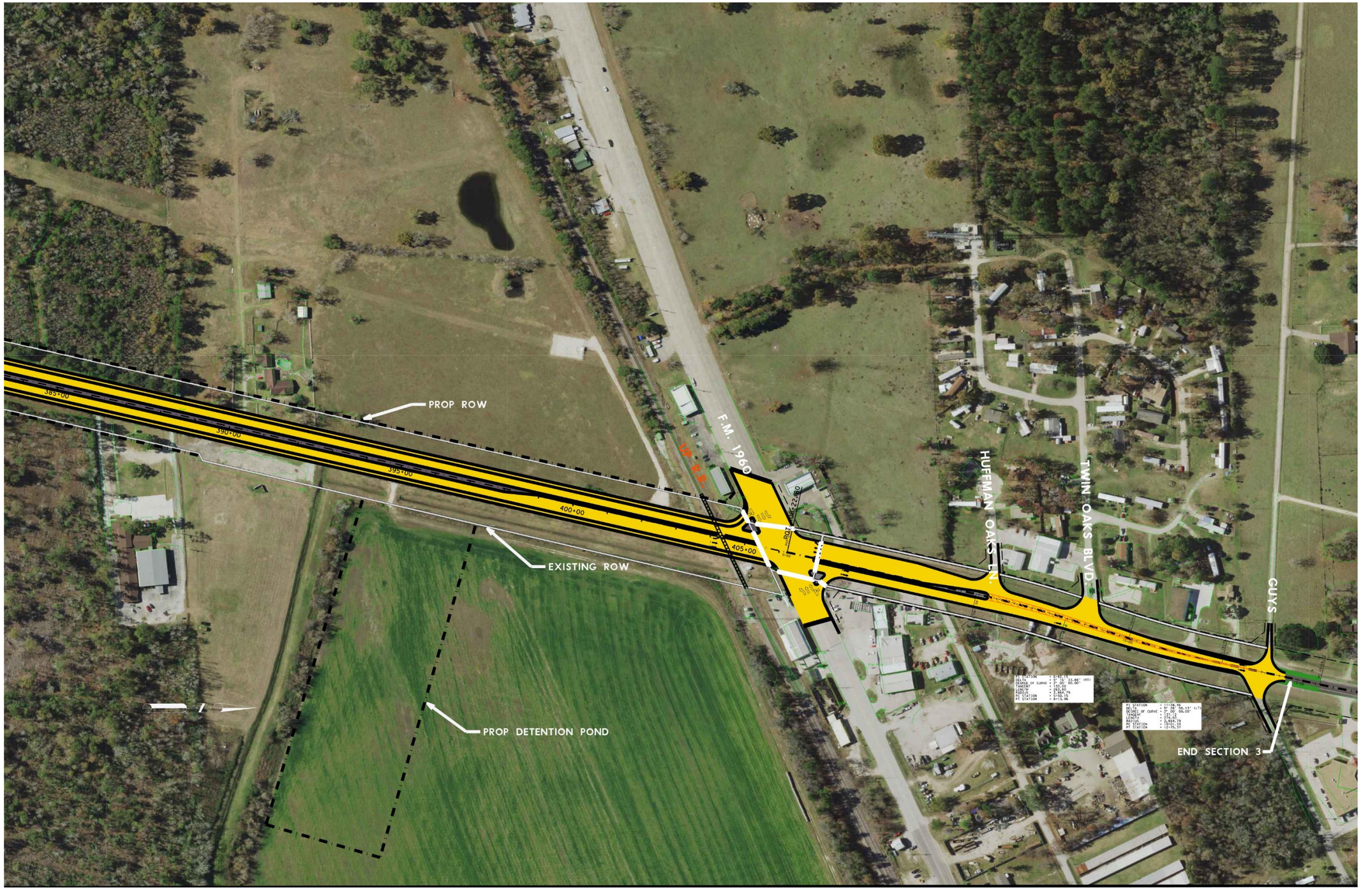

Figure 4l

Project Layout

FM 2100 from FM 1960 to S Diamondhead Blvd

CSJ: 1062-04-022

Appendix B

Regulatory Correspondence

Texas Department of Transportation®
DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

September 10, 2015

Section 106/Antiquities Code of Texas: Review and Comments (Permit #7228)
FM 2100 Expansion Project (CSJ: **1062-04-022**, -057, -058)
Houston District; Harris County

Ms. Patricia A. Mercado-Allinger
Division Director/State Archeologist
Archeology Division
Texas Historical Commission
PO Box 12276
Austin, TX 78711-2276

Dear Ms. Mercado-Allinger:

The proposed project will be undertaken with Federal funding. In accordance with Section 106 (and the First Amended Programmatic Agreement among the Texas Department of Transportation [TxDOT], the Texas State Historical Preservation Officer [TSHPO], the Federal Highway Administration [FHWA], and the Advisory Council on Historic Preservation) and the Antiquities Code of Texas (and the Memorandum of Understanding between the Texas Historical Commission [THC] and TxDOT), this letter initiates consultation for the proposed undertaking.

The proposed project would expand Farm-to-Market Road (FM) 2100 between South Diamondhead Boulevard and FM 1960 in Harris County, Texas. The proposed expansion would widen the existing two-lane roadway to accommodate between two additional main-lanes, raised median, paved shoulders and sidewalks, and seven detention ponds. Project is approximately 7.7 miles in length. Approximately 200-ft of additional right-of-way (ROW) would be acquired at various points along the FM 2100 APE for the proposed improvements. The proposed ROW would be acquired from privately-owned property. The APE is defined as the existing and proposed ROW and the depth of construction impacts. Depth of impacts is generally 3-ft or less across most of the APE, but would extend to as much as 10-ft in depth for the detention ponds.

The APE was previously surveyed by the Prewitt and Associates, Inc. (PAI), a consultant for the Environmental Affairs Division of TxDOT. PAI conducted a background review and an intensive survey (under Permit #3893) in November 2005 for the proposed project (1062-04-022 and -02-009). The Houston District of TxDOT attempted to acquire right-of-entry (ROE) to the proposed ROW; however, only a portion of the ROE needed was acquired for this survey. The intensive survey of the APE was incomplete due to the lack of ROE. No archeological historic properties, State Archeological Landmarks, State Historical Landmarks, nor properties eligible for listing on the National Record of Historic Places have been recorded within the APE of this proposed project. The Geologic Atlas of Texas, Houston Sheet (BEG, UT-Austin, 1982), depicts the proposed project APE within an area mapped as Pleistocene Beaumont Formation. The Soil Survey of Harris County, Texas (SCS-USDA, 1976), maps the entire APE as Aldine-Ozan association soils and Lake Charles series soils. The Houston PALM mapped the APE as Map Units #1, #2a, and #4. Map Unit #1 recommends and intensive survey with mechanical trenching if deep impacts are anticipated. Map Unit #2 recommends a surface survey only. Map Unit #4

recommends no archeological survey needed. The PAI survey did not encounter any archeological materials within the APE. The results of this survey were coordinated with your office on March 7, 2006 and received your concurrence on March 8, 2006 on TxDOT's recommendations for no further investigations needed for the portions of the APE that were previously investigated and to defer the remainder of the archeological survey until that time that access has been acquired.

In 2015, Cox/McClain Environmental Consulting, Inc. (COX), an archeological contractor to the Houston District, conducted an intensive survey under Texas Antiquities Permit #7228 of the remaining parcels of proposed ROW within that portion of the APE that had been denied ROE, but still warranted an archeological survey. The remaining parcels within the APE were assessed via pedestrian survey, shovel-testing, and mechanical trenching. No archeological materials were encountered during the survey and the APE was found to be extensively disturbed. Based on this information, COX recommended that the remainder APE was disturbed, does not warrant any further archeological investigation, and should be allowed to proceed to construction. TxDOT agrees with this recommendation.

Please find attached for your review and comment the COX draft archeological survey report; *Intensive Archeological Survey for Proposed Improvements to Farm-to-Market Road 2100 from South Diamond Head Boulevard to FM 1960, Harris County, Texas*. TxDOT recommends that the report is satisfactory and acceptable. TxDOT further requests your concurrence that the inventory is complete and sufficient, that the proposed undertaking would have no effect on any archeological sites, archeological properties, or State Archeological Landmarks, no further archeological investigations are warranted, and the proposed undertaking should be allowed to proceed to construction. If you have no comments on or objections to this report or the above recommendations, and find it acceptable, please sign below to indicate your concurrence and stamp the draft cover as acceptable.

Thank you for your consideration in this matter. If you have any questions or further need of assistance, please contact Allen Bettis of the TxDOT Archeological Studies Program at (512)416-2747-2747.

Sincerely,

Allen C. Bettis Jr.
Archeological Studies Program
Environmental Affairs Division

cc w/o attachments: Missy Green – Cox/McClain Environmental Consulting, Inc.
Christine Bergren – Houston District APD
ACB TTO PA File

Mark H. Cantrell 9-17-15

Concurrence: Date:
for Mark S. Wolfe, State Historic Preservation Officer

DRAFT

Intensive Archeological Survey for Proposed Improvements to Farm-to-Market Road 2100 from South Diamondhead Boulevard to FM 1960 Harris County, Texas

(CSJ: 1062-04-022)

Prepared by
Melissa M. Green, MA, RPA (Principal Investigator)
Cox | McLain Environmental Consulting, Inc.
6010 Balcones Drive, Suite 210
Austin, TX 78731

For
Texas Department of Transportation
Houston District

Under
Texas Antiquities Permit 7228

Cox | McLain Environmental Consulting Inc.
Archeological Report 099
(CMEC-AR-099)

DRAFT REPORT ACCEPTABLE
by Mark Wolfe
Executive Director, THC
Date 9-17-15
Track#

COX | McLAIN
Environmental Consulting

August 7, 2015

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by TxDOT pursuant to 23 U.S.C. 327 and a memorandum of understanding dated December 16, 2014, and executed by FHWA and TxDOT.

This report contains archeological site location information for public disclosure.